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CONTENTS

Frontispiece	116
Editorial	117-118
Production	120
Finance	121-123
Commerce	124
Shipping	125
Library	126

Special Articles

TITLE	AUTHOR	PAGE
Arbitration Would Prevent Price Wars	The Editor	119
Licenses and Future of Hydrogenation		127
International Trade in Crude Oil	C. Lloyd Jones	128-132
Russia's Advance in the Petroleum World	H. S. Bell	133-137
French Petroleum Politics and the C. F. P.	E. J. André	138-139
2nd International Drilling Congress		139
Developments in Eastern Venezuela	D. M. Veysey	140-141
Alberta's Bituminous Sands May be Mined	W. P. Hinton	142-144
Mexico Encourages Oil Development	D. Grahame	145
Tempora Mutantur et Socony-Vacuum Hinc Illi		147-150

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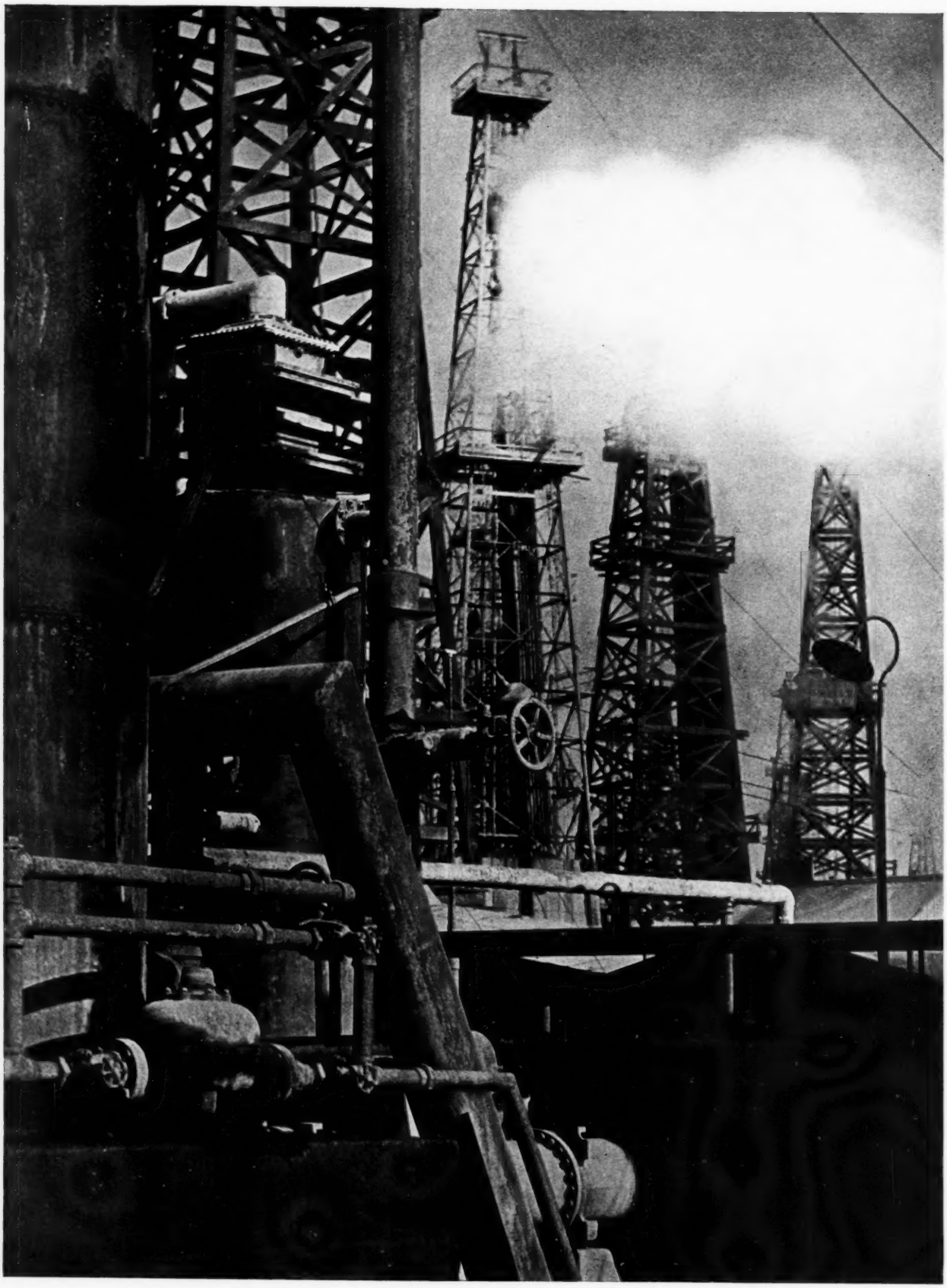

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PETROLEUM

Predicting Consumption

GREATER prominence has been given to predictions of consumption by the issue of a report on petroleum economics from the office of the U. S. Department of the Interior. It was a remarkable piece of work, produced in 10 days—as the report itself shows—by a committee of petroleum economists well respected in the United States because of their singular contributions to sane thought. The extension of such forecasts to all important consuming countries of the world, while replete with difficulties, should be taken in hand at once by competent authority. The purposes of the U. S. report were to forecast the anticipatable consumption of refined products in the U. S. in 1930, the production of crude needed to meet that demand efficiently and the best allocation of supply to the major producing districts separately. These were among the first aims of the cooperative plan killed by the administration in Washington last year. They are linked with world business. One cannot blandly enter 67 million barrels of gasoline exports into the U. S. petroleum budget sheet and expect the world to accept them without more ado. Producers and refiners in other lands have their own thoughts about sales outlets. The rational course is to consult with them, and the invitation was very clearly extended by Sir Henri Deterding in his Chicago outline of an Association of Cooperation.

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Avoiding Conflicts

RUSSIA is intent on selling her oil products to the world on a rapidly increasing scale, and room for them is obtainable only by the displacement of others. France is seeking to add Iraq oil to world production and to drive other oils out of her home market. Germany encourages her synthetic oil production by a tariff increase. This year, next year and in the years after, the petroleum products of American and other established oil companies will therefore find increasing competition, new competition, in many countries. New markets, new sales outlets will have to be found to replace some of the older ones. For instance, if Russia begins to ship oil products into the United States—and it is not a remote possibility—it will add a largely unexpected factor of disturbance to the U. S. domestic market. Or, again, a certain quantity of American oil will probably be diverted from the Orient as a result of the termination of the recent price war there. For fundamentally the market dispute there between the Royal Dutch interests and the Standard Oil Co. of New York arose from the desire of Socony to maintain in the ancestral territory of Royal Dutch its sales of American oils while increasing too its sales of local production bought from another American company. All over the world there are strong potential elements of trouble. The alternative to disputes is agreement, and agreement can be reached more cheaply and with less effort through cooperation than through strife, and can be maintained by penalty clauses or forfeits.

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Controlled Evolution

HEAVY investment in refinery equipment would of itself serve to restrain the Standard Oil Co. of New Jersey from too rapid an extension of the hydrogenation process into the oil industry. It must protect its own investment, and that is the best safeguard against a dislocation of the industry by quick revolution. Now the Standard of New Jersey has confirmed its previous announcement that the process would not be monopolized, and it is offering licenses on a plan devised to avoid future patent complications. A lot of skepticism still exists among those who have not been close enough to the process to become acquainted with it and who have not studied the new economics resulting therefrom. The fact that the German company last year produced 300,000 bbl. of gasoline from brown coal and sold its output in competition with standard gasoline should suffice to convert many of the skeptics if they will ponder over it. About 85 per cent of the coal is converted from solid into liquid fuel by this process which, as someone has said, is controlled evolution. Using petroleum as the raw material, substantially 100 per cent conversion is possible into any selected product. It is even reported that paraffin base products can be derived from asphaltic base oil. However gradually introduced into the oil industry the hydrogenation process will effect a great change, because it will eliminate the by-products, which today are, in an economic sense, waste products. All oil will be used on an efficiency basis. And when natural petroleum is exhausted, the process assures from coal sources a continuation of the supplies of liquid fuels indispensable to the modern order of the world.

Airplane Consumption

IN ABSTRACT the outlook on potential development of aeronautical gasoline demand is bright with promise of greatly increased consumption. When brought to the focus of existing demand, future consumption is found to be of limited magnitude unless we are prepared to make undue use of imagination. Last year the gasoline consumed by civil and commercial aeronautical operations in the United States was less than half-a-million barrels, according to the estimate of the Aeronautics Branch of the U. S. Department of Commerce. It represented an increase of 100 per cent approximately over the airplane consumption in 1928, which in turn was about double the total of 1927. Geometrical progression of that order arrests itself. To vision a doubling of the airplane gasoline demand each year appears so moderate that many are tempted to let the mind accept it. But look where it leads. If the U. S. aeronautical gasoline consumption were to double itself each year it would amount to about 500 million barrels for the year 1939. To contemplate aeronautical activity represented by that figure is not psychopathically approved.

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Australia's Problem

AFTER an orgy of private speculation, the more remarkable because not even a barrel of oil was produced to start all the promotions, Australia has counted the cost of relying upon inexperienced home talent for oil explorations. There may be exaggeration in the Australian estimates that £5,000,000 have been expended in the unrewarded drilling for oil, but investors certainly have dropped a lot of gold into dry holes. Considerable government subsidies have gone the same way. Now the Queensland Government has passed an Act permitting aliens to explore and drill. The Federal Government is studying ways to encourage the entry of experienced foreign companies into the southern island continent to search for the greatly desired oil. It is desired, firstly because home production would secure Australia against economic or military interruption of supplies and, secondly, in order to reduce the financial burden of the imports of oil products. Australia's exports are diminishing in specific value per unit. Declines in the price of wheat and wool in the world's markets have so greatly reduced her revenues that the Federal Government has not only been forced to increase the tariff rates on many articles, but also to limit the volume of certain imports and even to prohibit the entry of others that can be classed as luxuries. Australia would prefer to be in the position of exporting oil rather than of importing it.

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Changed Conditions

PROBABLY no oil legend persists more strongly or more universally than the belief that every Standard oil company is part of a monopolistic trust. The world must have its ogres as it has its idols, and the old Standard Oil combination dissolved by court decree in 1911 was one of the scariest ogres the world ever had. Even the U. S. government attorneys cling to the legend of it. The merger of the Standard Oil Co. of New York with the Vacuum Oil Co. fills them with hallucinations of restraint of trade and they rush to the court with a petition on behalf of the people to condemn the consolidation. There is no glory in it for them. The Standard Oil Co. of New York—or Socony, to use its trade name—has been so steadily losing its former share of the market that today it cannot claim more than 7 per cent of the sales in the United States. Merged with Vacuum it would possess about 8 per cent. With the competition the merged companies face today, it surpasses business understanding how any attorneys could hope to persuade a court that this merger presents the possibility of transgressing the anti-trust laws or violating the Standard Oil dissolution decree of 1911. For two reasons considerable space is given in this issue to the Socony arguments: firstly, to enlighten oil people all over the world about the Standard Oil and, secondly, to present an excellent summary of the changed conditions that have come over the oil industry in the course of the last 20 years.

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Japan, Not Java

TO STRAIGHTEN the record, a correction has to be entered against the inscription under the illustration on page 90 of the March issue of World Petroleum. The error was perceived too late for correction in that number, and, because it would not be obvious to the majority of readers, attention is directed to it here. Only those who live, or have lived in Japan or the Netherlands East Indies would be likely to notice that the picture representing the religious ceremonies at the spudding-in of a well showed a Japanese festival. The location was at Tanaka in the Niigata Prefecture. At the ceremony over 100 guests were present, including many laborers. Presents were distributed, and the elaborate feast cost nearly 4000 yen. In front of the Shinto priest may be seen the bottle of saki, food and flowers offered to the deity. Is it in order to make sure of the feast that the ceremony is held before the outcome of the drilling can be known? . . . In this number of World Petroleum, it has to be added, the title of the article on page 147 has been mutilated and should have read as given in the list of contents on page 115.

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Measured Opinions

HOW long the present production will continue", states a United States government report on petroleum, "is purely a matter of surmise; but, from present appearances—and considering the permanent character of the wells in Asia—it seems reasonable to suppose that it will always be sufficient for the wants of this country. Should it, however, come to an end, an ample and permanent supply of oil will be obtained, but at higher prices, from the shales and rich bituminous coals, which are found in almost all parts of the United States, and in the greatest abundance. Without going into the details of the calculation, the Commission give it as their opinion that the consumption of refined petroleum will increase rapidly in the United States." . . . This quotation is from a report issued by the U. S. Government 64 years ago. In February, 1866, a special committee of the United States Revenue Commission, under the chairmanship of S. S. Hayes, prepared a report on "Petroleum as a Source of National Revenue" which was published by the Treasury Department in the same year as Special Report No. 7. Undoubtedly it is the first government report on the petroleum industry in the United States. Though it concerned itself largely with matters of taxation, particularly with reference to the production tax of $1 a barrel levied at that time on each and every barrel of crude petroleum produced and sold, it also reviewed the development and technology of the petroleum industry in the United States and in the foreign countries and devoted a brief space to consideration of the future. . . . Since that report was issued, petroleum production has passed through flush periods and predicted shortage, consumption has shown astounding expansion, and it has become more true than ever before that an ample reserve exists both in shales and in coals. Plus ça change, plus c'est la même chose.

Arbitration Would Prevent Price Wars

Harmful Political Effect of Price Cutting in Major Market Disputes Requires Concerted Prevention by World Oil Industry

By The Editor

PUBLIC mistrust engendered by an oil price war reacts against all oil companies in every part of the world. Out of such excesses of competition is born the adverse popular sentiment that politicians seize upon to invoke government monopolies. It behooves the petroleum industry of all countries to recognize the immense stake it has in these costly conflicts. By international agreement the oil companies should bind themselves to refer market disputes to arbitration.

The Orient has been the theater of an oil price war of considerable severity and magnitude. Two of the world's biggest oil companies were resolutely at variance on important fundamentals. Each was firmly convinced of the righteousness of its own views, and in that faith was attempting to establish the domination of its opinions by practising them. There being no surer or quicker way to the expansion of a company's sales than the offer of a price advantage to the buyer, both companies were seeking the public favor by underbidding each other. Such conflict is costly to the companies and to their stockholders. To the buying public it is disturbing. From a business standpoint it is regrettable because it and its harmful effects are preventable by cooperation in the acceptance of arbitration.

Price wars produce an impression of low prices not easily effaced. Public memory, generally so short, retains for years the thought of low prices. For a generation thereafter the buyers regard a fair commercial price as a gouge. That enduring impression you find in any country where prices have once been slashed. It sets the stage for the politician. He knows an attack on the oil companies will be popularly acclaimed. Government control is demanded in the name of protection for the public. Votes are enticed by specious promises of a return to cheaper prices. The culmination, as we have witnessed with disquieting frequency in the last series of years, is a monopoly or government participation in the oil business . . . and another market is then closed against private enterprise. To all oil companies in every land such a price war as the markets of the Orient have been witnessing is a matter of deep importance. Companies outside that territory may suffer no financial loss, but they are not immune to the effects. The political reaction falls upon the entire oil industry of the whole world—even if in some countries less than in others. In a business sense the oil industry is the integration of all the oil companies, and all are therefore affected. Peoples criticise, censure or condemn the oil companies en masse.

Prevention of price wars can be achieved by international cooperation, and the time for action is the present. There are no statutes to prevent it, and all the laws of sound business are for it. Provision must be made for arbitration of market disputes. Cooperation need not extend beyond a constituted international oil arbitration association, having no other purpose or function than to promote the settlement of trade disputes without resort to price wars. The mere existence of such a body, adequately representative of the oil industry, would always enable one party to each dispute to propose resort to arbitration. One may point the case by considering whether the oil markets of the Orient would not have been unshaken had the invitation stood open to Royal Dutch or to the Standard Oil Company of New York to seek a business decision from a mutually acceptable arbitrator. And if you wonder about the invitation, just reflect on the other oil companies in the territory who cannot disengage themselves from the price slashing and are forced to defend their own trade at a heavy cost.

Reports of price wars travel round the world. They are printed in the newspapers of all capitals, there to serve as material for the politicians. That is a consequence every oil company should aid to avoid, and the best way to avoid it is by organizing in future to prevent the price wars.

It would be absurd to contend that conditions of world commerce are so settled that no more market disputes are to be anticipated. At this very time elements of trouble can be perceived in more than one territory. Market hunger will always exist: it is the salt of business. Liquidation of excess stocks leads to difficult situations. Companies, of the opportunist type, which jump into, and out of, markets with amazing unconcern and exhibit astonishment at the protests of those serving the territory regularly are also a potent source of trouble. The need exists for an association of commanding respect to help smooth out the irritations and follies of this highly competitive world.

World Oil Production · February 1930

DAILY production during the month of February registered a slight gain, to which the United States contributed about the same as all other countries combined. The total daily increase was about 2400 tons m., nearly 17,000 barrels. Third rank among the world's producing areas seems to have passed definitely to the Netherlands East Indies and Sarawak. In the Dutch colonial territory the production was officially estimated at about 420,000 metric tons (2,940,000 barrels), the balance being credited to Sarawak Oilfields, Ltd., in the British protectorate. Russia showed only a small daily increase. In Venezuela there was a further decline, though slight. It is to be expected that the total production outside the United States will continue to grow steadily, even though curtailment may be shown in the North American fields and in Venezuela. Mexican production is expected to show gains as the year progresses and Russia certainly will increase its total. Demand outside the U. S. should continue to grow at the rate shown in recent years.

		February, 1930	February, 1930
World Production	World Petroleum	111,106,540 bbl.	15,872,363 tons m.
United States	A. P. I.	*74,260,300 bbl.	10,608,614 tons m.
All other countries	World Petroleum	36,846,240 bbl.	5,263,749 tons m.
Venezuela	estimate	10,467,000 bbl.	*1,495,286 tons m.
Russia	official	7,988,190 bbl.	*1,141,170 tons m.
Neth. East Indies & Sarawak	official	3,334,450 bbl.	*476,350 tons m.
Mexico	official	*3,270,661 bbl.	467,237 tons m.
Persia	estimate	3,259,200 bbl.	465,600 tons m.
Rumania	official	3,010,000 bbl.	*430,000 tons m.
Colombia	official	*1,520,541 bbl.	217,220 tons m.
Peru	official	*1,000,476 bbl.	142,925 tons m.
Argentina	estimate	676,620 bbl.	96,660 tons m.
Trinidad	official	*658,683 bbl.	94,098 tons m.
India—British	estimate	560,000 bbl.	80,000 tons m.
Poland	official	340,200 bbl.	*48,600 tons m.
Japan and Taiwan	estimate	158,060 bbl.	*22,580 tons m.
Egypt[1]	private	141,400 bbl.	20,200 tons m.
Ecuador	official	*114,798 bbl.	16,400 tons m.
Sakhalin	estimate	98,000 bbl.	*14,000 tons m.
Canada	official	*89,961 bbl.	12,852 tons m.
Others†	estimate	158,000 bbl.	22,571 tons m.

[1] Anglo-Egyptian Oilfields, Ltd. † Germany, Iraq, France, Czecho-Slovakia, etc.
* Measure used in official returns; conversions uniformly at 7 barrels per ton m.

World Oil Production · March 1930

RETURNS for the month of March cannot be totalled because of the delay in receipt of figures from important countries. Probably they will show an increase, notwithstanding the reduction in the daily rate of production in the United States. Russia has jumped her output to the rate scheduled for the entire year. In March her production was equivalent to over 16,000,000 metric tons per annum (80,000,000 barrels). Trinidad also showed a considerably increased rate of production during March, and is climbing towards the million barrel mark in contest for priority over Peru. During the next few months the Sakhalin production will probably show a marked augmentation. The Japanese concessions on that island show steady advances, and a considerable program of extension is scheduled on the Russian areas, where large tankage is being erected. Ecuador continues to increase.

		March, 1930	March, 1930
United States	A. P. I.	*78,865,400 bbl.	11,266,486 tons m.
Venezuela		... ... bbl.	... ... tons m.
Russia	official	9,653,000 bbl.	*1,379,000 tons m.
Neth. E. Indies & Sarawak[1]	private	3,691,800 bbl.	*527,400 tons m.
Persia	estimate	3,608,710 bbl.	515,530 tons m.
Mexico	official	*3,491,000 bbl.	498,714 tons m.
Rumania		... ... bbl.	... ... tons m.
Colombia		... ... bbl.	... ... tons m.
Peru		... ... bbl.	... ... tons m.
Trinidad	official	*815,339 bbl.	116,477 tons m.
Argentina	estimate	749,070 bbl.	107,010 tons m.
India—British	estimate	619,500 bbl.	88,500 tons m.
Poland	official	378,000 bbl.	*54,000 tons m.
Japan and Taiwan	private	174,300 bbl.	*24,900 tons m.
Egypt[2]	private	163,436 bbl.	23,348 tons m.
Ecuador	official	*142,817 bbl.	20,402 tons m.
Sakhalin	estimate	108,500 bbl.	*15,500 tons m.
Canada	estimate	*99,634 bbl.	14,233 tons m.
Others†	estimate	175,000 bbl.	25,000 tons m.

† Germany, Iraq, France, Czecho-Slovakia, etc.
* Measure used in official returns; conversions uniformly at 7 barrels per ton.
[1] Sarawak separately about 63,000 tons m. (441,000 bbl.) [2] Anglo-Egyptian Oilfields, Ltd.

FINANCE

London · April

Definite views as to the reason for recent improvement in the London oil share market are difficult to obtain. The movement seems to indicate that there are times when almost any peg is good enough to hang a rise on. United States production and storage figures are regarded as satisfactory to the extent that they show output at a definitely lower level than at one time last year. But they are still inconclusive. Average daily output fluctuates considerably from week to week, and storage statistics point to the probability that in the best circumstances a considerable time will elapse before normality is in sight. On the other hand, the fact that New York itself is drawing favorable conclusions from the statistical position is naturally encouraging to dealers on this side.

MANY of the rises which have taken place, in some cases to the year's highest, are in anticipation of satisfactory annual reports. It is noted that some United States concerns are issuing good profit figures, and leading British undertakings are considered likely to do the same. Anglo-Persian, Burmah, Shell, Royal Dutch and Lobitos will all make their earnings known during the next month or two.

The market in Anglo-Americans has practically dried up, following the exchange into Standard Oil Export Corporation preferred shares. Dealings have ceased in V.O.C. Holdings, the shares of Venezuelan Oil Concessions (issued in exchange under the capital rearrangement) taking their place in the market. The price was also adjusted to allow for the "rights" to the issue of one new share at par for every three shares held.

THE result of the issue of 5,000,000 Shell 70/0 second preference shares at 25s. gave the market an unpleasant surprise. Advance views on the merits of the issue were reflected in the ease with which it was underwritten. Total underwriting commission was no more than 1¾ per cent on the £1 nominal value of the shares, and the fact that this was readily accepted indicated a belief that they would make a strong appeal to the investor.

That the present is not the best time for raising new capital, except on very attractive terms, was demonstrated when the result of the offer became known. Of the 5,000,000 shares offered, the public subscribed for a little over 850,000, underwriters being left with nearly 83 per cent of their commitments.

London Stock Exchange Prices

1930 High	1930 Low	1929 Div. % per ann.	Share	Feb. 15–April 12 First	High	Low	Last	Change
7/6	3 1/16	3 1/2	Anglo-Ecuadorian	1 1/16	1 3/16	1 1/16	1 1/16	+1/16
2 5/8	2 1/4	22 1/2	Anglo-Egyptian "B"	2 15/16	2 5/8	2 15/16	2 5/8	+3/16
4 15/16	3 5/8	12 1/2	Anglo-Persian	4 1/2	4 15/16	3 7/8	4 5/8	+5/16
1 15/16	1 3/8	52 1/2	Apex Trinidad (5s.)	1 1/2	1 7/16	1 3/8	1 7/16	+1/16
2	1	7 1/2	Attock	1 15/16	1 15/16	1 3/4	1 15/16	−3/16
17/16	1 1/16	12 1/2	Brit. Borneo (10s.)	1/2	17/16	1 1/16	17/16	+1/16
1 1/16	9/16	7 3/4	Brit. Burmah (8s.)	5/8	1 1/16	9/16	9/16	−1/16
7/16	5/16	....	Brit. Controlled ($5)	3/8	7/16	5/16	7/16	+1/16
3/8	1/4	....	Brit. Controlled, Prefd. ($5)	5/16	3/8	1/4	11/16	+1/16
4 1/8	3 15/16	20	Burmah	4 1/16	4 1/8	3 15/16	4 1/8	+3/16
21/16	1 7/16	....	Canadian Eagle (no par)	1 3/16	1 1/16	1 7/16	1 1/16	+3/16
5/8	1/4	....	Kern River (10s.)	5/16	5/16	1/4	5/16	+1/16
2 5/8	1 13/16	10	Lobitos	1 21/16	2 1/8	1 13/16	2 1/16	+3/16
3/4	5/16	....	Mexican Eagle ($4 Mex.)	1 1/16	1 3/16	1 1/16	1 3/16	+1/16
61	51	....	Pan Amer. "B" ($50)	54	60 3/4	53	60 3/4	+6 3/4
1 1/16	1/16	2 1/2	Phoenix	5/8	5/8	5/8	1 1/16	−1/16
34	30 1/16	24	Royal Dutch (100 fl.)	32 1/2	34 1/8	30 1/16	33 1/8	+1 3/8
4 3/16	4 3/4	25*	Shell Transport	4 3/4	4 3/16	4 1/16	4 7/16	+5/16
1 1/16	1 1/16	4	Steaua Romana	1 1/16	1 1/16	1 1/16	1/16	−1/16
3 7/8	3 1/16	30	Trinidad Leasehold	3 15/16	3 7/8	3 1/16	3 15/16	−1/16
1 1/16	9/16	....	Utd. Brit. of Trinidad (6s. 8d.)	1 1/16	1 1/16	9/16	1 1/16	....
3 1/16	2 15/16†	22 1/2	Venezuelan Oil Concessions	2 15/16	3 1/16	2 15/16	2 15/16	−1/16

*Denotes tax free dividend. †Denotes "ex rights" price.

Nominal value of shares £1 unless otherwise indicated by bracketed figures.

The principal reason for this unsatisfactory result was the general apathy of markets, but it is evident that the issue price of 25s. was fixed too near the previously existing quotation for the old shares of the same class. The latter were quoted at about 26s. before the new issue was announced. They were subsequently marked down to just over 25s., leaving the new shares very little cheaper than the old, with the result that the only subscribers to the issue were permanent investors.

A SCHEME put forward by the directors of the V.O.C. Holding Company will effect a simplification of the capital of the Royal Dutch-Shell group's principal Venezuelan interests. The company was formed in 1921 to carry out a plan for the supply of additional capital to Venezuelan Oil Concessions. As part of this arrangement it acquired a majority holding in that company, whose shareholders received V.O.C. Holding shares in exchange for their holdings. It is now proposed to liquidate the Holding Company, transfer its outside assets to the Concessions Company in exchange for shares, and distribute the latter to its shareholders on a share for share basis. V.O.C. Holding proprietors will thus once more become direct holders of capital in the operating concern. The scheme will involve increase in the Concessions Company's capital from £1,000,000 to £5,400,000, and a further £1,800,000 in £1 ordinary shares will be raised to provide for the further development of the properties. The latter shares are to be offered at par to shareholders and to those in the Holding Company on the basis of one new for three shares held. The new issue of capital is required to replace and release for dividend purposes profits utilized for capital expenditure in 1929 and during the current year to date. It will also provide additional working capital. At one of the meetings held in connection with the share rearrangement, Viscount Bearsted stated that capital expenditure during three and a half years to the end of 1929 had amounted to over £4,000,000. Part of this sum was provided by a share issue amounting to £1,800,000 early in 1927. The remainder has come from depreciation allowances and amounts taken from earned but undivided profits. This policy is based on the board's opinion that in a business such as oil production, and under conditions ruling during the last two or three

years, large allowances are necessary. It reflects the traditional Royal Dutch-Shell method of building up a strong financial position, and in the present case has give the V.O.C. companies a very prominent position in Venezuelan oil production. The meeting, coming at a time when public interest in the stock markets generally was increasing, was responsible for a quick rise in V.O.C. Holding shares.

ALTHOUGH not directly concerned, the market was greatly interested in the issue in New York and Amsterdam of $40,000,000 Royal Dutch 4 per cent debentures, carrying option rights. The imminence of the new financing had been denied from an official quarter, but dealers could not dismiss the impression that something of the kind was afoot. This idea was fostered by the fact that Shell Transport—the Royal Dutch Company's junior partner —recently issued £5,000,000 of second preference capital. The Royal Dutch issue will mean another big increase in the resources of the combine. Official announcements indicate that the new funds provided by the issues are likely to be kept in hand for the present, as part of the policy of having extensive cash assets always available for taking advantage of new business openings. But dealers are discussing the possibility that the raising of new capital foreshadows some definite new development of the Royal Dutch-Shell organization.

SIPARIA Trinidad Oilfields, Ltd. is being formed with a capital of £500,000 to take over the properties and rights of the Palo Seco and Siparia areas in Trinidad from the Venezuelan Consolidated Oilfields. Trinidad Leaseholds will provide the administration and a large part of the finances required. The market believes this will assure to those areas a fair trial under sound conditions.

A. H. DAY.

New York . April

Oil shares have completely recovered from the weakness of the first two months of the year and have forged sharply ahead into new ground. Practically the entire group established new highs for the year, and many issues advanced by more than a third of their market value. The turn of speculative interest toward the oils was based upon news of a favorable nature, such as renewed efforts in proration of crude output in the Mid-Continent and California and the response by a number of the leading companies to the request of the Federal Oil Conservation Board that refinery runs throughout the country be curtailed one-seventh. This response did not result in actual reduction in gasoline production, but the advent of higher seasonal consumption will undoubtedly result in withdrawals from storage during the coming months. However, the gasoline situation is still weak, and determination of probable profits for this year is to say the least problematical.

VACUUM OIL COMPANY reported net earnings for 1929 of $35,767,627, equal to $6.96 a share on 5,139,887 shares, in comparison with $37,659,458 and $7.46 a share for 1928. Deductions from gross profits included $2,126,388 for inventory depreciation, against only $763,450 in 1928, and Federal tax reserve of $1,000,000. Net plant account increased during the year from $26,778,948 to $36,241,264, while cash and securities declined from $33,740,306 to $18,431,734, current position remaining very strong, however.

GULF OIL CORPORATION reported 1929 net, after all charges, equal to $9.83 a share on 4,525,221 shares, against $8.06 in 1928 on 4,504,921 shares. The Mellon interests of Pittsburgh are credited with owning more than 90 per cent of the stock, and their very conservative management is well illustrated by 1929 dividend disbursements of $6,772,000 paid out of available net of $44,000,000, which was left from $136,900,000 of total income after deducting $93,000,000 for taxes, depreciation, development costs, interest, etc. Surplus for the year after dividends was $37,000,000, largest in the history of the company. It is also worthy of mention that during the year nearly $60,000,000 was spent for investment in properties, plant and equipment. This was done without increase of funded debt or of notes payable, with less than $1,000,000 added to capital stock account and with a decrease in cash and investments of only $8,000,000. The balance sheet reserve for depreciation and depletion stands at almost 50 per cent of the total property, plant and equipment account.

ANOTHER sample of conservative accounting practice is found in the annual report of Humble Oil & Refining Company, subsidiary of Standard Oil (New Jersey), which revealed net equal to $10.93 a share in comparison with $6.50 in 1928. Profits available for the capital stock amounted to $32,535,721, against $19,277,145 in 1928 and were arrived at after deductions for taxes, intangible drilling costs, depreciation, depletion, etc. totaling $37,461,000. Dividend disbursements amounted to $5,937,815, leaving $26,597,265 to be transferred to surplus. Balance sheet showed $12,000,000 added to net plant account, and indicated cash and call loans of more than $34,000,000 in comparison with total current liabilities of about $23,000,000.

THE annual report of Texas Corporation confirmed the preliminary release of earnings equal to $5.12 a share on the average number of shares outstanding during the year, and equal to $4.90 on the 9,850,050 shares outstanding at the end of the year. The usual conservative deductions were made for depreciation, depletion, etc. Net for the capital stock was $48,318,000 against $45,073,000 the previous year, and dividends paid totaled $28,494,000. The balance sheet reveals an increase in net property account of $45,500,000 and in investments (presumably in affiliated, but not consolidated, companies) a gain of $7,200,000. Cash increased about $2,000,000, and a new item of about $50,000,000 in marketable securities made its appearance. To offset these asset gains we find on the liability side an increase in the capital stock account of about $35,000,000 and a new issue of convertible debentures amounting to $100,000,000. We also find that the $30,000,000 of notes payable, which appeared in the 1928 balance sheet, were retired in 1929. Texas is the leading company in the industry in the United States outside of the Standard group and is the only company to conduct marketing operations in its own name in every State.

SKELLY OIL COMPANY reported consolidated net income for 1929, after all charges, equal to $5.28 a share on 1,095,581 shares, compared with $3.67 a share in 1928 on a slightly smaller number of shares. The company is a medium sized Mid-Continent unit largely engaged in production, and is one of the oil companies most interested in the natural gas industry, which is expanding very rapidly in this country. Other oil companies having a large stake in this field include Standard (New Jersey), Texas, Standard of California and Phillips.

STANDARD Oil (Indiana) reported 1929 net equal to $5.37 a share on the average stock outstanding during the year and equal to $4.66 a share on the 16,850,587 shares outstanding at the close of the year. Balance sheet showed cash and its equivalent amounting to $122,-

692,000, the largest such total in the company's history. Report of Pan American Petroleum & Transport, one of the principle subsidiaries, has not yet been made public, although it is understood that 1929 earnings will approximate those of 1928.

NET INCOME of Richfield Oil Company of California for 1929 amounted to $8,554,494, equal to $4.03 per share on 1,947,241 shares of common, after allowing for preferred dividend requirements. Net in 1928 totaled $7,818,076, equal to $3.80 per share on a slightly smaller number of shares. The company is one of the important West Coast units, and has recently entered the East Coast markets on a large scale through its subsidiary Richfield Oil Corporation of New York, incorporated last August.

STANDARD Oil Company of California reported for 1929 gross income of $66,384,618 and net income of $46,633,490, equal to $3.63 a share on 12,845,980 capital shares of no par value. This compares favorably with 1928 gross of $66,026,086 and net of $46,083,817, equal to $3.66 a share on 12,594,098 shares outstanding at the close of that year. The balance sheet showed no important changes. Cash and call loans declined about $13,000,00 to $21,345,781, and net property account increased by a similar amount to $474,377,754. Ratio of current assets to current liabilities at close of year was 9.5 to 1.

Company is credited with being the largest crude oil producer of the country and the third largest refiner. It holds practically one-half the acreage of the Kettleman Hills field, where 6000 acres of proved oil lands are owned on the north dome alone. The district is under restriction so that development will not proceed faster than the oil is needed.

California's new gas conservation law prohibits wastage of the state's natural gas resources, and the Standard Company is thus forced to take an important part in the growth of the natural gas industry in that section. A long term contract with Pacific Gas & Electric, the largest of the West Coast utilities, has been made to provide outlet for gas from Kettleman Hills, and Pacific Public Service Co. has been acquired to provide additional outlet through its subsidiary, the Coast Counties Gas & Electric Co.

DUE to larger production and sales of crude, and to lower costs of production and handling, Lago Oil & Transport Corp. reported an increase in net for 1929 to $2,816,144 as against $2,066,502 in 1928. These figures are after all charges, taxes and minority interests, and they equal 70 cents and 51 cents per share respectively on 3,992,689 no par shares. Company is 96 per cent owned by Pan American Petroleum & Transport, which in turn is over 80 per cent owned by Standard Oil Co. (Indiana), and it is one of the three major producing interests in Venezuela. Lago production centers in Maracaibo basin and is shipped to the island of Aruba, Netherlands West Indies, where Pan American refinery is being brought to capacity sufficient to handle Lago's entire output. Net output in 1929 totaled 32,452,131 barrels, against 27,797,277 barrels in 1928. Gross crude storage at end of 1929 was 7,679,893 barrels against 4,064,324 barrels at close of previous year. Since beginning operations the company has drilled a total of 397 wells, of which only five have been unproductive.

AMONG new financing announced during the month of March were three oil issues of importance. Royal Dutch completed arrangements with Dillon, Read & Co. of New York by transatlantic telephone for floating $40,000,000 of 4 per cent debentures, series A, with nondetachable warrants. These will be dated April 1, 1930, and will mature April 1, 1945. They are offered at 89½ to yield 5 per cent, and it is understood that a substantial portion of the issue was withheld from the American syndicate for offering in Holland. Dillon, Read also offered $15,000,000 of 5 per cent debentures of Union Oil Company of California, maturing April 1, 1945, and priced at 99½ to yield 5.05 per cent. Pure Oil Company offered $20,000,000 of ten year 5½ per cent sinking fund gold notes to mature March 1, 1940.

FOLLOWING soon after the announcement of the merger plans of Standard Oil of New York and Vacuum the revelation of tentative consideration of joining Standard Oil (New Jersey) and Standard Oil of California gives further evidence of the trend toward consolidation in the industry. It was reported that about a year ago legal opinion as to such a merger was sought. Inquiry of the Department of Justice at that time elicited an adverse opinion based upon the dissolution decree of 1911. No contract or agreement appears to have been formulated at any time, and probably no definite action will be taken until the test case of Standard of New York and Vacuum has been decided. Such a merger would assure Standard (New Jersey) indefinite retention of its present leading position among American oil companies. C. C. BAILEY.

New York Stock Prices

1930 High	1930 Low	Current Div. Rate	Stock (Par Value $)	Sales (Shares)	Feb. 20—Apr. 12 First	High	Low	Last Change[1]
51⅜	36¼	†2.00	Atlantic Refining (25)	670,700	39½	51⅜	38	49⅝ +11⅛
34	20½	†2.25	Barnsdall, A (25)	813,200	21⅜	34	20¾	31¾ +10⅝
8¼	5⅛	.....	Colon Oil (No)	31,300	6	8	6	6⅞ + ⅝
30¼	19½	.....	Continental Oil (No)	537,800	20½	30¼	19¼	28⅝ + 8⅝
7½	5⅝	.....	Creole Petroleum (No)	55,100	5¾	7½	5⅝	6⅝ + 1
160⅞	131¼	1.50	Gulf Oil Corp. (25)	104,400	132	160⅞	131¼	155½ +21⅛
117	78	2.00	Humble Oil & Ref. (25)	119,100	83⅞	119	82	116 +33
30	22⅛	0.50	Imperial Oil (No)	95,200	23¼	30	22⅛	28¾ + 5
28⅜	17¾	.....	Indian Refining (10)	728,600	20¾	28⅜	18	23¼ + 3
24	17⅞	1.00	International Petr. (No)	135,600	18½	24	18	23¾ + 5⅛
26½	21¼	.....	Lago Oil & Trans. (No)	14,300	22½	26½	22¼	25 + 2⅞
37	16⅛	.....	Mexican Seaboard (No)	1,509,800	20¾	37	18¾	33⅝ +13⅛
60¼	50½	.....	Pan Amer. P. & Tr., B (50)	41,700	51⅝	59¾	51⅝	57 + 5⅜
41⅞	29¼	2.50	Phillips Petroleum (No)	501,300	30⅝	41⅞	29½	39¾ + 9⅛
54	45	2.00	Prairie Oil & Gas (25)	69,200	48	54	45	52¾ + 4¾
27¼	21⅛	1.50	Pure Oil (25)	301,700	21¾	27¼	21⅛	25¾ + 4⅛
28¼	22¼	2.00	Richfield Oil (25)	285,200	24	28¼	23⅝	26⅝ + 2½
56½	49¼	*3.20	Royal Dutch (N. Y.) (13⅓)	160,000	50½	56½	49⅜	54½ + 4
25⅛	21	1.40	Shell Union Oil (No)	186,800	21⅜	25⅛	21¼	24¼ + 2½
32	21⅝	2.00	Sinclair Consol. (No)	1,047,600	23	32	22⅝	31 + 8
42	28⅞	2.00	Skelly Oil (25)	227,000	29⅜	42	28⅞	40⅜ +11⅜
73¾	55½	2.50	Std. Oil of Calif. (No)	301,000	59¾	73¾	57⅝	71 +12¾
59¾	49⅜	2.50	Std. Oil of Indiana (25)	362,300	50¼	59⅞	50	57¾ + 7⅝
37⅛	33¼	1.60	Std. Oil of Kentucky (10)	52,300	35½	37	34⅞	35⅞ + ⅛
80⅜	58	†2.00	Std. Oil of N. J. (25)	2,430,900	58¼	80⅜	58¼	79 +19⅞
38⅝	31¼	1.60	Std. Oil of N. Y. (25)	544,900	32	38⅝	31¾	37¼ + 5¾
70	53	‡1.00	Sun Oil (No)	12,500	53½	70	53½	67½ +14½
59¾	50⅞	3.00	Texas Corp. (25)	347,000	51⅜	59¾	50⅞	58¾ + 7¼
17¾	10¾	0.60	Tide Water Assoc. (No)	411,700	11⅝	17¾	11	17½ + 6½
20⅞	16¼	.....	Transcontinental,new (No)	382,200	16¼	20½	16¼	19¼ + 3
50	41⅜	‡.00	Union Oil of Calif. (25)	71,900	42¼	50	42	47¼ + 4¾
96⅞	88⅛	†4.25	Vacuum Oil (25)	80,500	92¾	95⅝	90	92⅞ + 1⅞
4½	2¼	0.20	Venezuelan Petr. (5)	61,700	3¼	4½	3	3½ + ⅜

[1] Since close of last month's table. † Including extras. ‡ Plus 9% in stock. ‡ Plus 4% in stock.
* Paid last year—no regular rate.

COMMERCE

Hong-Kong · 1929

Most of the petroleum products entered into Hong-Kong are for transshipment to southern China. (On the Commerce page in the February issue of World Petroleum indications of that trade in 1928 were given). Last year's gasoline imports into Hong-Kong were 85 per cent ahead of the previous year's, fuel oil was up 11 per cent, kerosene was steady and lubricating oil was down 13 per cent.

ORIGIN OF IMPORTS: Abstract

Gasoline—Total	171,480 bbl.	100%
United States	94,850 bbl.	55%
Neth. E. Indies	76,630 bbl.	45%
Kerosene—Total	981,400 bbl.	100%
United States	662,400 bbl.	67%
Neth. E. Indies	319,000 bbl.	33%
Fuel Oil —Total	143,457 tons	100%
Neth. E. Indies	81,674 tons	57%
United States	61,783 tons	43%
Lub. Oil —Total	50,830 bbl.	100%
United States	37,970 bbl.	75%
Neth. E. Indies	12,860 bbl.	25%

Dept. of Commerce, Washington, D. C.

Norway · 1929

Imports of gasoline and fuel oils increased last year, but a diminution was shown in the quantity of kerosene and illuminating oil imported.

	1929	Change
Gasoline	77,469 tons m.	+26%
Kerosene	40,783 tons m.	—13%
Gas & Fuel Oil	151,560 tons m.	+33%

Central Statistical Bureau, Oslo.

Russia · 1929 Fiscal Year

In the fiscal year ending Sept. 30, 1929, the total exports of petroleum products showed a gain of 30 per cent over the figures of the preceding year. In the tabulation hereunder the quantities represent totals of all petroleum products exported to the respective countries named.

Exports are shipped not only to countries of Europe and northern Africa, but also to India and Argentina. They continue to increase at an average rate of about 30 per annum, and their influence will become more marked. Russian export statistics are to be accepted as reliable. Wherever they can be checked against import figures of various countries they show correspondence therewith, inside the usually accepted limits.

DESTINATION OF EXPORTS: Abstract

United Kingdom	725,400 tons m.	20%
Italy	519,100 tons m.	14%
Germany	484,600 tons m.	13%
France	356,100 tons m.	10%
Spain	307,800 tons m.	9%
Egypt	238,300 tons m.	7%
Turkey	184,200 tons m.	5%
India, British	174,200 tons m.	5%
Czecho-Slovakia	92,600 tons m.	2%
Belgium	86,900 tons m.	2%
Africa, French	85,200 tons m.	2%
Scandinavia	63,500 tons m.	...
Persia	48,100 tons m.	...
Austria & Hungary	32,100 tons m.	...
Latvia & Lithuania	31,000 tons m.	...
Greece	18,500 tons m.	...
Esthonia	16,600 tons m.	...
South America	16,500 tons m.	...
Finland	14,900 tons m.	...
Manchuria	8,200 tons m.	...
Bulgaria	7,100 tons m.	...
Netherlands	4,400 tons m.	...
Ships' bunkers	95,700 tons m.	2%

Due to use of round figures the total of the quantities listed above is 3,000 tons short of the true total of all exports of petroleum products during the fiscal year 1929. Segregated into classes of products the export totals are:

SUMMARY OF EXPORTS

Total	3,622,000 tons m.	100%
Gasoline	1,036,100 tons m.	29%
Kerosene	778,300 tons m.	22%
Lubricants	261,600 tons m.	7%
Fuel & Crude	1,546,000 tons m.	42%

U. S. S. R., Moscow.

Russia · 1930 Fiscal Year—1st Three Months

In the first three months of the fiscal year 1930 (Oct., Nov., Dec., 1929) the Soviet oil exports compared with the corresponding period of the previous fiscal year as follows:

	3 mths., 1930	Change
Gasoline	262,900 tons m.	+31%
Kerosene	201,800 tons m.	+ 4%
Gas Oil	82,200 tons m.	+20%
Fuel Oil	336,800 tons m.	+40%
Lub. Oil	38,400 tons m.	.....
Crude	50,900 tons m.	+40%
Total	973,000 tons m.	+25%

In addition thereto were 14,800 tons of unspecified petroleum products exported to Persia during the same period.

U. S. S. R., Moscow.

United Kingdom · 1929

This country is the world's third largest importer of petroleum and petroleum products, being surpassed only by the United States and the Netherlands West Indies. Last year the United Kingdom imported over 65 million barrels. The United States supplied 32 per cent of the total. Persia furnished 21 per cent. The Netherlands West Indies had over 10 per cent of the trade. Russia's share was about 8 per cent. Trinidad and the Netherlands East Indies figured about 5 per cent each. Counting Trinidad with the Netherland West Indies and Venezuela, the Caribbean region supplies about 10 per cent of the total imports. Notable is the quantity of fuel oil imported to compete with British coal for ship's bunkers.

ORIGIN OF IMPORTS: Abstract

Crude —Total	13,932,290 bbl.	100%
Persia	9,714,288 bbl.	70%
Colombia	1,356,382 bbl.	10%
Neth. W. Indies*	1,058,283 bbl.	8%
Venezuela	790,203 bbl.	6%
Trinidad	596,972 bbl.	4%
Mexico	394,721 bbl.	3%
* Venezuelan crude transshipped.		
Gasoline—Total	23,143,447 bbl.	100%
United States	13 282 551 bbl.	57%
Persia	3 441,695 bbl.	15%
Russia	2,189,173 bbl.	9%
Neth. E. Indies	1,307,181 bbl.	6%
Neth. W. Indies	1,208,742 bbl.	5%
Roumania	724,486 bbl.	3%
Straits Settlements	467,004 bbl.	2%
Mexico	320,320 bbl.	1%
Other Spirit —Total	3,501,115 bbl.	100%
Borneo—Dutch	1,790,060 bbl.	51%
Roumania	1,394,084 bbl.	40%
Neth. W. Indies	238,824 bbl.	7%
Kerosene—Total	7,289,758 bbl.	100%
United States	2,690,396 bbl.	37%
Russia	2 439,046 bbl.	33%
Persia	766,327 bbl.	11%
Roumania	720,595 bbl.	10%
Mexico	514,180 bbl.	7%
Borneo—Dutch	139,315 bbl.	2%
Gas Oil —Total	3,255,464 bbl.	100%
United States	1,982,072 bbl.	61%
Neth. W. Indies	522,704 bbl.	16%
Mexico	366,485 bbl.	11%
Russia	232,520 bbl.	7%
Trinidad	81,427 bbl.	3%
Roumania	64,087 bbl.	2%
Fuel Oil —Total	11,619,899 bbl.	100%
Neth. W. Indies	4,427,785 bbl.	42%
Trinidad	2,645,986 bbl.	23%
United States	1,620,884 bbl.	14%
Mexico	1,267,255 bbl.	11%
Russia	604,426 bbl.	5%
Persia	384,355 bbl.	3%
Roumania	171,001 bbl.	1%
Lub. Oil —Total	2,799,120 bbl.	100%
United States	1,930,116 bbl.	68%
Mexico	321,164 bbl.	11%
Russia	305,969 bbl.	11%
Roumania	82,440 bbl.	3%
Germany	82,053 bbl.	3%
Belgium	43,104 bbl.	1%

All figures converted from the official totals in Imperial gallons at the rate of 35 Imp. gal. per barrel (42 U. S. gal.)

Board of Trade, London.

SHIPPING

London : April

Scandinavian owners are placing contracts with British shipyards for first class tanker tonnage, later to be chartered on long term to Dutch and American companies. The majority of these contracts are for motor driven vessels of relatively high speed. While most tank ship owners still favor a steady 10 knots speed as amply sufficient for oil transportation, technical developments of supercharge have rendered possible the design of Diesel power plants to develop continuously about 40 per cent more power than from engines of the same size and weight without supercharge. The latest Anglo-Saxon mass order for 20 motor tankers—one of the largest shipbuilding orders ever placed—takes advantage of supercharge, and each ship will have a service speed of 12½ knots.

Sales

The relatively small tanker of only 5500 tons dw. now under construction at the Burmeister & Wain yard, Copenhagen, has been taken over by Arvid Bergvall of Oslo. This ship is due for delivery at the end of the year.

Influx of new tonnage into the charter market and into the regular tanker line market does not seem to be accompanied by any large disposal of old tonnage. This appears to indicate there is ample work for the majority of tankers of all ages afloat.

The tanker Emile Deutsch de la Meurthe, sold recently by the Anglo-Saxon Petroleum Company to Scandinavian interests is to be re-named Gundine, and is announced as having been sold for about £76,000. After sale this ship was chartered by her original owners.

Greek buyers have been responsible for the purchase of a Norwegian tanker, Conrad Mohr, of about 6150 tons dw., for the sum of about £30,000. This ship was built at Middlesboro in 1909 and was owned in Bergen.

Another Scandinavian tanker recently sold is the Realf, built originally as the Athelbeach in 1918 and twice renamed. She carries just over 8000 tons dw. and was sold by an Oslo owner to an owner in Moss, Norway, for £67,600. Originally owned by the United Molasses Co., she had been sold to Scandinavian owners in September, 1929. At the time of sale she was chartered to the British Molasses Company, for 10 years at 5/9d. per ton.

New York

The placing of orders for new tankers has continued to be one of the bright aspects of shipbuilding on this side of the Atlantic during the past few weeks, although nothing spectacular has occurred such as that of the placing of another bulk order of Anglo-Saxon type.

Deutsche Werke recently received an order from Arnt J. Morland of Arendal for a motor tanker of 10,800 tons to be delivered in July, 1931. A very satisfactory charter has been fixed, the vessel to run for 10 years for the Anglo-American Oil & Shipping Co. at a rate of 7/- per ton for the first five years and 6/9d. per ton for the second five years. This vessel is to have 11½ knots service speed, which again is less than the speed the Anglo-Saxon Company seems to set with its new tonnage.

Another interesting order recently placed for a large ship is that of the Anglo-Persian Oil Company for a 10,000 ton dw. ship from a Glasgow shipyard. This is in addition to the order for six ships placed by this company recently.

A tanker of 11,500 tons has been ordered by Houlder Line interests, the official owners being the Empire Transport Co. of London. Houlder Line interests at present own one large motor tanker of 11,120 tons dw., the Caroni River, which was completed in October, 1928. The order for the new ship goes to the Blythswood company in Glasgow, builders of the Caroni River.

A new feature of European tank ship construction is the construction of coastwise ships of the up-to-date type developed on the American seaboards. Russian Oil Products, Ltd., have ordered an interesting vessel of this type from Chas. Hill & Sons, Bristol. These newcomers to British shipbuilding, it is reported, will shortly be in the market for new tonnage of a similar kind. The ship recently ordered has a 900-ton spirit carrying capacity and a 10½ knot speed.

The Spanish Petroleum Company is reported to be in the market for several large motor tankers of about 11,000 tons dw., and another Spanish tanker company is to build a motorship with the exceptionally high power of 8800 b. hp.

While tanker construction continues to be brisk in most European shipyards—and just how brisk it is on the Continent can be gathered from the fact that Götaverken has had to sub-contract some of its hulls to British yards—one of the most interesting pieces of construction yet ordered is at the Palmer yard at Hebburn-on-Tyne. There the Anglo-American Oil Company's tanker Cadillac is having an entire new mid-ship portion built. In dry dock she will be cut into three sections; the old mid-ship section will be floated out and the new mid-ship section connected to the forward and aft ends. Cadillac, as a matter of fact, was built in the Palmer yard during the war period and went through a number of the viscissitudes that wartime tonnage had to put up with. Feats of ship surgery such as this were not unusual occurrences during the war, but very seldom does one hear of anything like it at the present time. It is not yet known whether the capacity of the vessel will be increased in any way, but this would hardly seem likely, because she is a large capacity ship already.

A. C. HARDY.

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"AT THE temple of perpetual fire near the ancient town of Olympus, the natural gas issuing from the ground has been burning for 2500 years", writes Djevad Eyoub, who made an extended field trip recently through the Murefta and Antalia regions of Turkey. "There are two sources from which flames 18 inches to 24 inches high keep burning. The locality is 40 miles south of the town of Antalia, at the head of the Gulf of Antalia, southern Asia Minor. It is a mile from the sea and can be distinguished by passing ships during the night. There is little doubt of the presence of a large quantity of gas in the area, which is faulted and disturbed. The gas issues from the contact of a large serpentine mass and Eocene limestone of massive character."

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SUBSCRIPTIONS received from many large companies show that they have been quick to realize the value of World Petroleum to their executives and their more ambitious understudies. May we ask you to bring this new publication to the attention of your key men?

Licenses and Future of Hydrogenation

Maximum Constructive Influence on the Oil Industry is Sought by Plan to Issue Licenses to Leading Refiners Through a Cooperative Licensing Company in Which All Will Own Stock

LICENSING plan whereby the oil industry of the United States will be able to avail itself of the hydrogenation process has been prepared by the Standard Oil Company (N. J.). There is reason to believe that a similar plan will be drawn up for the licensing of companies in other countries.

To carry out the licensing plan in the United States the Hydro Patents Company has been organized to hold the exclusive right of issuing licenses for the use of the hydrogenation process in and for that country.

At present all the issued stock of the Hydro Patents Company is held by the Standard Oil Development Company, but within a short time an invitation to subscribe to the stock of the Hydro Patents Company will be offered to various units of the industry. This invitation will be extended to those companies which are thought to be in a position to take advantage of this process because of their refining capacity. Such companies will be stockholder-licensees.

It is intended that in the future licenses to employ the hydrogenation process will be available to other units of the industry who may not own stock of the Hydro Patents Company.

The Hydro Patents Company will be required to pay to the Standard Oil Development Company certain fixed royalties on account of each license granted and to pay also certain running royalties. In turn the Hydro Patents Company proposes to put into effect a licensing plan for this process by which the United States rights to use the process will be owned by its principal licensees. Each licensee will be required to own stock of the Hydro Patents Company and to take a license which, measured by barrels of daily hydrogenation capacity, will equal the number of shares of Hydro Patents stock which it owns. Licensees will also be required to enter into an agreement with the Hydro Engineering and Chemical Company, another new subsidiary.

On request the Hydro Engineering and Chemical Company will make available to licensees of the Hydro Patents Company the technical knowledge of the Standard Oil Company (N. J.) and of the I. G. Farbenindustrie Aktiengesellschaft in common relating to the hydrogenation process. This company will manufacture and maintain stocks of catalysts, which on request, it will supply to licensees of Hydro Patents. The licensees of Hydro Patents will also submit to the Hydro Engineering and Chemical Company all plans, lists and specifications for the construction, enlargement or alteration of equipment for carrying on the hydrogenation process, and this company will furthermore act as designing and construction engineer for licensees and will make complete plans, estimates, specifications and lists and supervise all construction work.

In 1927 the foundations of a new refining practice, which gives promise of revolutionizing the oil industry in the future, were laid at Baton Rouge, Louisiana. Intensive laboratory wok on the hydrogenation process was carried on for two years at the research laboratories of the Standard Oil Company of Louisiana, supplemented in 1928 by the erection of a small plant for experimentation with the process on a commercial scale at that company's Baton Rouge Refinery.

Finally, in the fall of 1929, at Bayway, N. J., work was begun on the first large scale hydrogenation plant designed to operate on petroleum. This plant, which is now almost completed, will have a nominal charging capacity of 5000 barrels per day and is expected to begin operations in the early summer of the current year. One other hydrogenation plant of the same capacity is now being erected at Baton Rouge, and a similar plant of like capacity is under design for the Humble Oil & Refining Company at Baytown, Texas.

Stripped of all technical language, the main process of hydrogenation consists in adding hydrogen to the heavy crude oils or to the residues from lighter crudes after the gasoline and other light products have been removed therefrom.

Petroleum is a mixture of many hydrocarbons. Those boiling at relatively low temperatures can be distilled from it without decomposition. The hydrocarbons which vaporize only at high temperatures are broken down or cracked during the process of distillation, and lower boiling products are formed. These cracked, higher boiling products contain less hydrogen in proportion to carbon than those which can be obtained by simple distillation at relatively low temperatures. This deficiency in hydrogen is supplied by the hydrogenation process.

Up to the present there have been but two generally accepted methods for obtaining light distillates from petroleum (1) distilling off the low boiling hydrocarbons and (2) cracking the heavier ones. This has now been supplemented by a third basic process, hydrogenation.

With ordinary refining methods and with the cracking processes the best result the refiner has been able to obtain up to the present is approximately half a barrel of gasoline from one barrel of crude oil. From an average quality crude he gets approximately 40 per cent gasoline, 20 per cent kerosene, lubricants and other products, and 40 per cent heavy fuel oil. To find the market for this fuel oil has been the industry's greatest problem, and the disposal of heavy fuel oil, produced in excess of the economic demand therefore has served to demoralize the fuel market. In fact, by reason of this excess production, the price of fuel oil has so declined that it has eliminated coal as a fuel in many markets near refining centers.

The hydrogenation process, with its potential ability to convert the whole of a barrel of crude oil into gasoline whenever necessary, provides a definite solution of this basic problem of the industry.

Naturally, many problems in connection with the most effective application of this process to the problems of the industry still remain. The three plants at Bayway, Baton Rouge, and Baytown, however, will afford an opportunity to study hydrogenation on a full commercial scale and to determine the most efficient and economical method of fitting this new principle into its proper place in the modern oil refinery. The license basis will provide opportunity for cooperation by the industry at large in the further development of the process.

International Trade in Crude Oil in 1928, Expressed as Exports and Imports by Countries

Figures Indicate Thousands of U. S. Barrels (42 U. S. gallons)

From

| Into | SOUTH AMERICA | | | | | | | | CENTRAL AMER. | | | NORTH AMER. | | ASIA | | | | | EUROPE | | | | | | | |

International Trade in Crude Oil

About 200 Million Barrels of Crude Petroleum Were Transported From Producing Countries To Consuming Countries in the Year 1928.

By Chester Lloyd Jones
Dean, School of Commerce
University of Wisconsin

HITHERTO no picture of the flow of crude oil in world trade has ever been presented. It is a subject bristling with difficulties. Official statistics of imports and exports are in most countries reported only annually and are often long delayed. Contradictory figures are found in comparisons. The picture here given is correct in outline, but some of the detail is rendered uncertain by the conflicting data. The source of material has mainly been Foreign Commerce and Navigation of the U. S. 1928, the Commerce Yearbook, 1929, Vol. II and the reports of U. S. commercial attachés, consular agents and representatives of the Bureau of Foreign and Domestic Commerce, made available through the cooperation of Dr. John Frey of the Department of Commerce, Washington.

CRUDE OIL PRODUCTION has been one of the highly migrating factors in modern industry. In the late fifties of last century when it was still measured by a world total of perhaps not more than a few thousands of barrels, Rumania was the leading source of supply. Then leadership shifted to the United States, within the boundaries of which one field after another was brought in from Pennsylvania to California and from Michigan to Texas. Meanwhile other fields scattered in distant parts of the world and some of which had been modestly worked for centuries, were also made productive.

At the opening of the century Russia led the world, but lost first place in 1902. It held second position till the break in 1917, when Mexico's rapidly increasing yield put it into second place, a position held till 1928, when the rapid increase of Venezuelan, and decline of Mexican, operations brought the rank of the chief producing countries to be the United States, Venezuela, Russia and Mexico. Persia, the Dutch East Indies and Rumania now form a secondary notable trio.

Though the production of crude has now reached almost a billion and a half barrels a year, or about ten-fold what it was in 1900, only a comparatively small portion enters international trade. Most of the yield, like that of many other staples such as wheat, Indian corn, rice and pig iron, is consumed in the country where it is produced or is transformed to reach world markets ready for consumption. The result is a sharp contrast between the ranking of areas in the production of crude and in the contribution which they make to international trade in petroleum of that form.

On the basis of the latest year for which fairly complete and reliable data have been reported, viz. 1928, first place in crude exports was taken by Venezuela (92 million barrels), followed by the Netherlands West Indies (26 million)—see comment hereon in next paragraph—Mexico (22 million), the United States (19 million), Colombia (18 million), Persia (14 million), Trinidad (6 million), and Peru (5 million). Outside this leading group, crude oil exports fall into small totals of less than five million barrels shipped by a scattered group of countries, many of them small producers.

Even this list of leading shippers is one which demands explanation. The Netherlands West Indies crude shipments are in reality Venezuelan oil transshipped at Curaçao and Aruba. They are, therefore, a part of the Venezuelan exports. The figures as reported by importing countries give receipts from the United States for 1928 as over 21 million barrels (vide supra). And so on. An arbitrary choice has sometimes to be made between conflicting official figures of presumably equal authority.

Persian exports of petroleum are largely crude oil. Important production there is confined to one company, which refined in the only plant operating in the country in 1928 only about a tenth of the total yield of that country's crude.

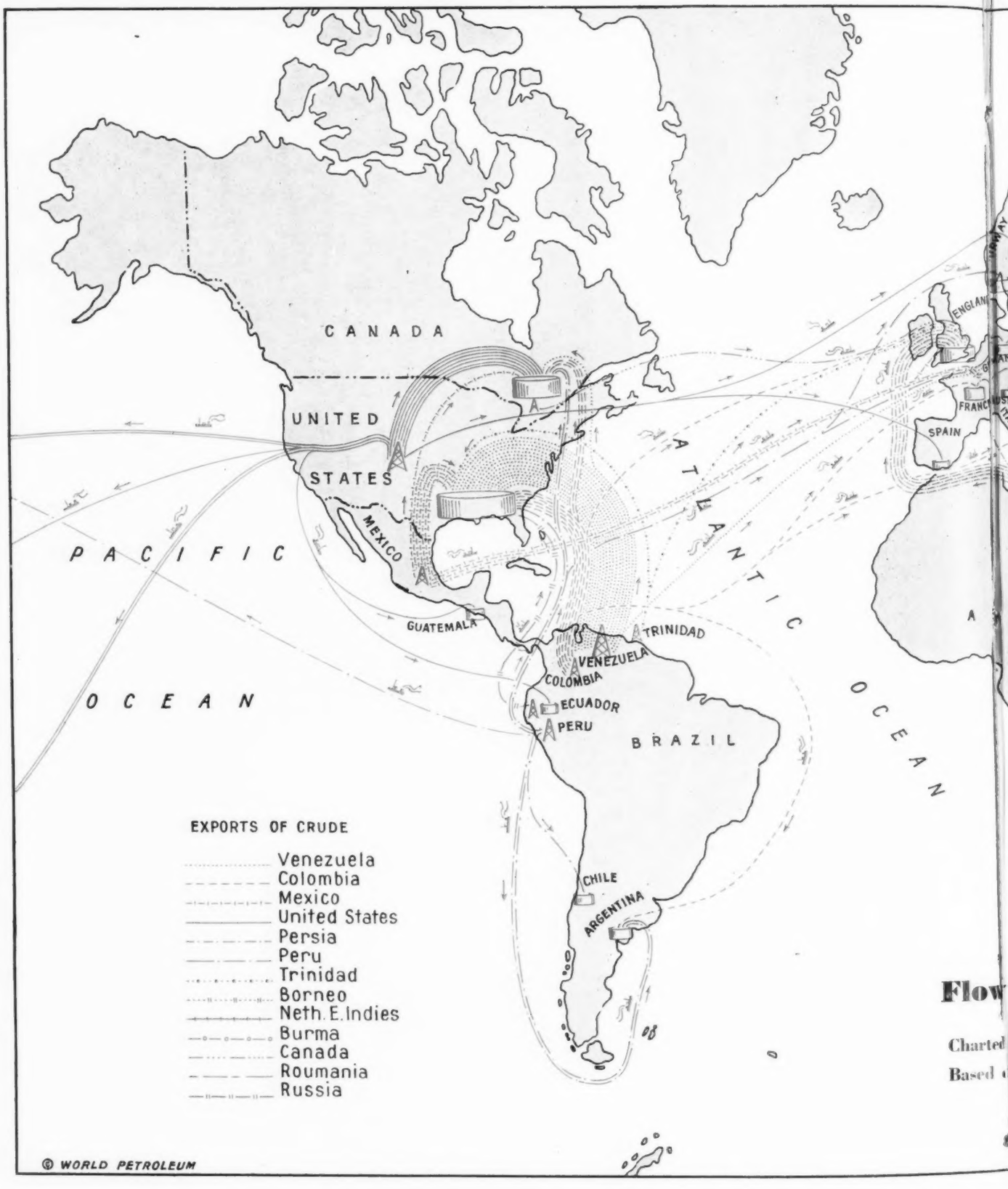
Finally the United States, while it ranks as an exporter of importance, is also an importer. Its imports in 1928 were in fact over four times as great as its exports, crude oil alone being here taken into account for the comparison.

From the above summary it is evident that the region contributing most heavily on balance to the crude oil shipments in international commerce is the Caribbean area—that term being elastically extended to include Mexico.

Net exports of crude as reported by producing countries total for 1928 some 190,000,000 barrels. Of this amount the Caribbean countries shipped 74.6 per cent, the other Latin American countries 3.5 per cent, the United States 11.2 per cent, Persia 7.62 per cent, and other countries 3.1 per cent.

The Latin-American percentage includes for Argentina only the shipments to the United States and also 326,000 barrels imported from Uruguay which were transit shipments. The percentage for Persia is figured on an export of 14,377,000 barrels calculated on the imports of Persian crude oil into various countries for 1928, though the exports of crude petroleum for the year 1927-8 are reported as 10,964,000 barrels in Commerce Yearbook, 1929, Vol. II, p. 516). The great discrepancy between both these figures and the total Persian production is attributable possibly to bunker crude supplied to overseas British naval bases or ships and not entered in the imports of any country.

The flow of crude oil shipments is subject to two influences of contrary character. The natural tendency for manufac-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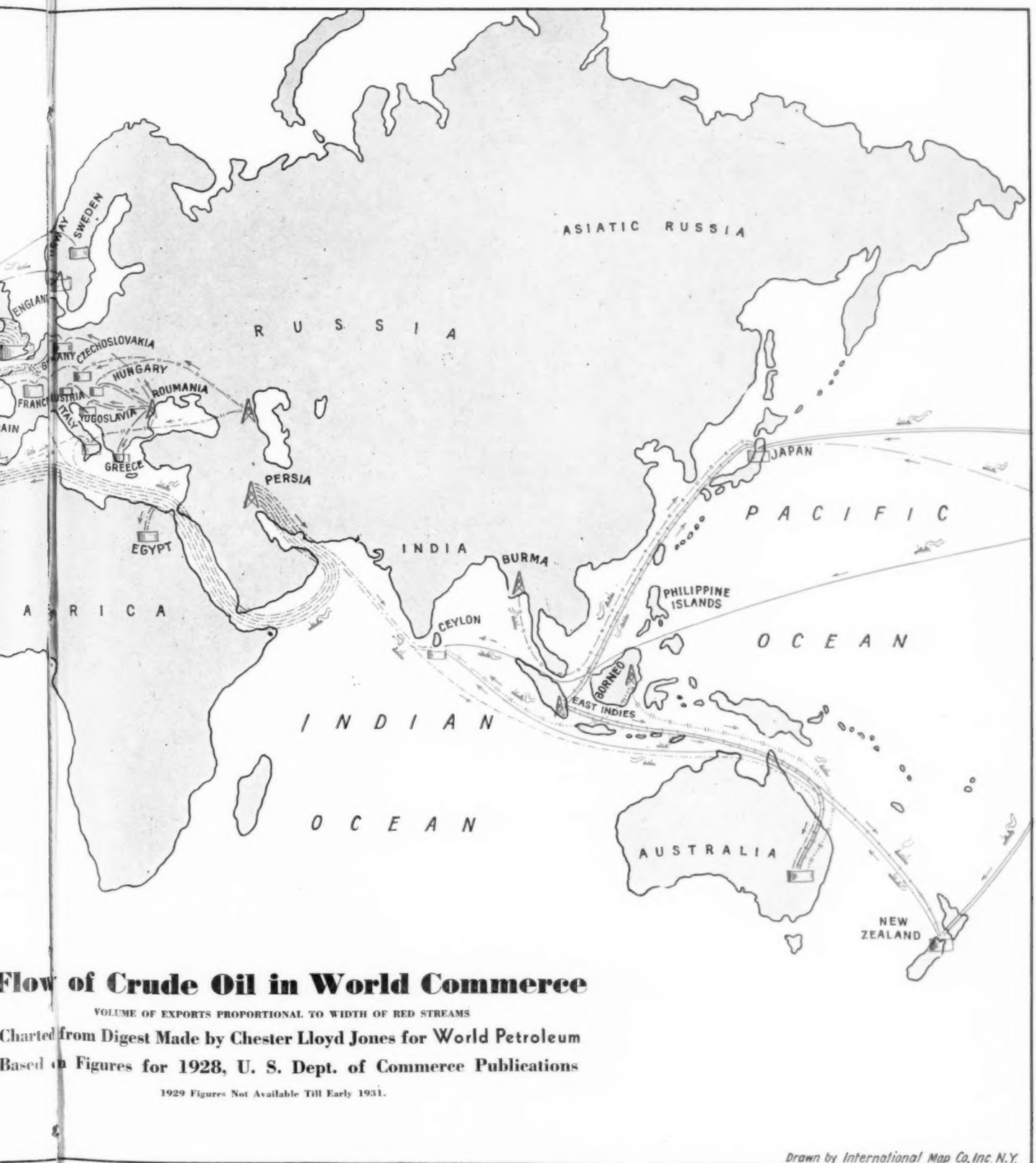

Flow of Crude Oil in World Commerce

VOLUME OF EXPORTS PROPORTIONAL TO WIDTH OF RED STREAMS

Charted from Digest Made by Chester Lloyd Jones for World Petroleum

Based on Figures for 1928, U. S. Dept. of Commerce Publications

1929 Figures Not Available Till Early 1931.

Drawn by International Map Co, Inc. N.Y.

ture is to establish itself as near as possible to the source of supplies. This fact works against the entry of crudes into international trade. A number of nations have adopted the policy of encouraging manufacture of petroleum products within their own borders, thus to secure for their own peoples the wages of labor going into the manufacture and to decrease the dependence on foreign refineries not subject to their political control. Other influences affecting the market are the lack of local refining facilities in the producing areas and lack of direct transport to market for the distribution of the refined product which could be produced. These latter factors stimulating shipment of crude from oil producing centers tend, other things being equal, to be temporary and to disappear.

In obedience to the first influence mentioned, refineries have sprung up in large numbers to serve the fields of the United States, Russia, the Netherlands East Indies, Roumania and Poland, making these countries contribute only a minor fraction of their crude oil to export.

In two important producing areas, Venezuela and Persia, special conditions have deterred a similar development. Exports of Venezuela oil as crude reach 95 per cent of production, though large quantities are refined in the Netherlands West Indies just off the coast. Heavy shipments of crude oil from Persian fields are still seeking a distant market, especially in Great Britain.

Public encouragement to local refining and therefore—in the case of countries without local supplies—to imports of crude oil, has grown in popularity in recent years. Various means have been adopted such as entry for crude oils free from tariff or at low rates, other fiscal advantages, government purchase of stock in refining companies and the creation of monopolies in petroleum trade.

Largely under such influences the refining industries of Australia, Cuba, Egypt, Germany, Japan, Spain and some of the smaller European states have been built up. But the outstanding example of the creation of the refining industry in a country having no commercial production of crude of its own is found in the United Kingdom. There the crude imports in 1913 were only 31,700 barrels, but in 1927 they were almost 19,000,000 barrels. Under the conditions of the flooded market of 1928 they fell to 14,891,000 barrels.

The new world occupies a surprising position as the source of the supplies of crude oil entering international trade, but it occupies also a prominent place as the chief market for crude which passes national boundaries. In imports of crude, as in exports, the Caribbean is nominally in a prominent position due to the special position in which the Netherlands West Indies stand in relation to Venezuelan exports. If the transit portion of this movement be disregarded, since it is not a normal example of the crude oil shipments, the greatest crude importing region by far is North America, with the United States in 1928 taking about 80,000,000 barrels and Canada some 24,000,000. The world's greatest producer of crude is also its greatest importer, and the two north American countries taken together buy only slightly less crude than all the rest of the importing countries of the world combined.

In this trade is found one of those curious movements familiar to every student of international commerce. The United States imports of about 80,000,000 barrels in 1928 came northward from Central and South America. Over half of the total came from Venezuela, partly through the Netherlands West Indies, and all but a small portion of the rest from Mexico and Colombia. From the United States in turn went northward to Canada 15,431,230 barrels out of a total of 18,961,362 barrels exported. This figure as reported by the importing countries is 21,163,000 barrels. These shipments were over two-thirds of all the imports of Canada, which imported the rest of its requirements chiefly from Colombia and Peru.

Outside of the new world, by far the greatest international market for crude oil is found in Great Britain, a fact the more remarkable since the refining industry, except for minor shale oil refining, is almost entirely one established in the period since the great war and especially since 1921. British import is as great as that of Japan, Australia, Argentina, the Netherlands, the Bahamas and New Zealand combined, these being next in order of importance. Purchases in 1928 were greater than the crude imports of all the other countries of Europe and Africa combined. Persian fields are the chief reliance of British refiners, though as late as 1925 almost half of the supply of crude was drawn from the Caribbean region.

World shipments as reported for 1928 amounted to 215,910,000 barrels. Of this amount 26,457,000 is the transit trade through the Netherlands West Indies. Of the 189,459,000 barrels representing other imports the United States took 42.3 per cent. The Netherlands West Indies imported for local refining 22.5 per cent, Canada took 12.8 per cent, and Great Britain 7.8.

The smaller streams of crude oil which reach the international market go to the farthest corners of the earth. Their number is great, but their percentage in the total reaches only 14.6.

Summary

The trade in crude oil is but a small part of the international trade in petroleum products and will continue to be so. Wherever labor supply, stability of local government and other operating factors permit it, the gravitation of manufacture to the producing countries will continue.

A large share of the trade which now exists is due to special circumstances such as the newness of the developments in certain of the Caribbean areas, the accident of Dutch ownership of the islands off the Venezuelan coast and the encouragement of refining in Great Britain.

Up to the present time the efforts made elsewhere than in Great Britain to create refining industry in regions lacking local petroleum resources and far from the source of supply have not resulted in the development of a flourishing trade in crude oil.

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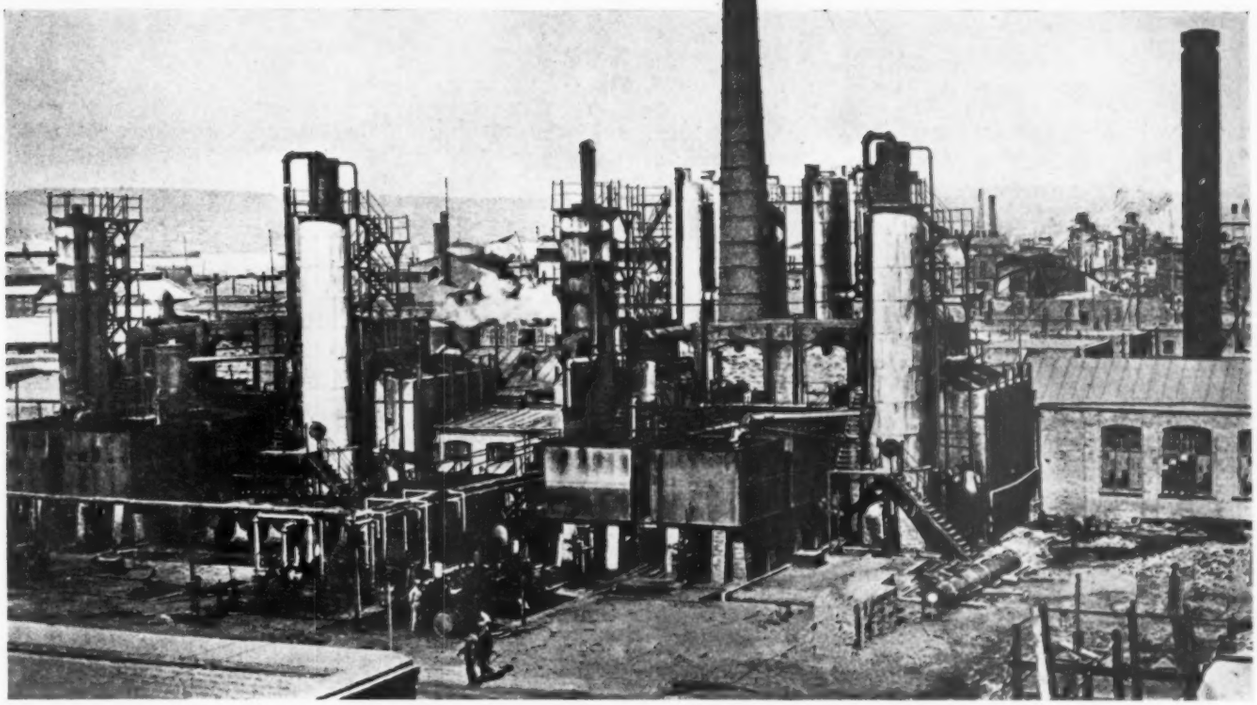
ALTHOUGH activities are all on a very small scale in Barbados, British West Indies, the production of the British Union Oil Company there has shown an increase of more than 50 per cent during the latter part of last year. Before 1924 this company drilled a few wells at Turner's Hall Wood, in the northern part of the island, but the quantity of oil obtained has not, up to the present, been sufficient to justify further drilling. Since the superintendent, H. Keith, visited the oil fields of Maracaibo Basin, Venezuela, last year, improved methods of production have resulted in the increase. The oil obtained at Turner's Hall field is brought by truck to the small refinery at Needham's Point, Bridgetown. The plant works twice a week, making gasoline and kerosene, and the output being sold locally. To supply the further needs of the island, such as diesel oil for the local electric light concern, the company also imports from the Pan American Refinery at Aruba, Dutch West Indies. Barbados petroleum, which has an asphalt base, has evidenced itself at Turner's Hall Wood in the form of small seeps and gaseous springs, and, according to favorable geological reports, may exist in more productive quantities, though up to date no rich supply has been located.



Refinery of 5 million barrels annual capacity built in 1928 by Soviet engineers from their own designs

Russia's Advance in the Petroleum World

Impressions of Field Work, Refinery Operations, Labor and Management, as Registered on a Visit to Centers of Russian Oil Industry

By H. S. Bell

Consulting Petroleum Engineer
New York, N. Y.

OCTOBER 31, 1933, will be an important date in the business history of the world. That day will mark the completion of the Five Year Plan for Economic Construction adopted by the Soviet Government of Russia. The date will determine the success or failure of the most gigantic social-industrial experiment the world has known. The oil industry is one of the major divisions of this general plan.

At the start of the World War, Russia's annual oil production approximated 9,000,000 metric tons. During the subsequent civil wars, it declined to a figure of 5,000,000 tons by the year 1923. In the fiscal year 1927-28, at the close of which the new economic policy became effective, the production had been augumented to 11,600,000 metric tons. The goal for the year 1932-33, the culmination of the five years' program, was originally set at 22,000,000 tons, was later raised to 26,000,000 tons, and now a further increase to 40,000,000 tons is under consideration.

To date, production has increased to a figure of 14,000,000 tons for 1929. In January 1930, the annual rate of production was equal to about 15,000,000 tons. The estimated production for the year 1929-30 is over 16,000,000 tons. It is, therefore, apparent that the rate of increase is in accord with the originally anticipated goal of 22,000,000 tons by 1932-33. More intensive drilling will undoubtedly follow to meet the later increased quotas. From observation of the fields, the reserves are ample to meet the most optimistic program, but equipment and organization are needed.

To one familiar with the Russian prewar oil industry the changes to date must be astounding. Instead of the primitive bailing methods one finds electric pumping equipment, the air lift and all other modern apparatus for economical drilling and production. The older refineries are gradually replacing their obsolete equipment with modern distilling, cracking and treating apparatus. The new refineries, such as the ones at Batum and Touapse are modern in all respects.

The two principal government owned oil trusts are the Azneft and the Grozneft. The first now produces about 64 per cent and the second 34 per cent of the oil. Both are completely rounded out organizations, with geological, drilling, producing, refining, transportation and distributing departments. The competitive element, except in foreign markets, is lacking, a fact which is of considerable assistance in the orderly development of the properties.

Baku, the oil city around which most of the activities of the Azneft centers, is a strange mixture of the old and the new. It is located on the shores of the Caspian, 87 feet below sea level. Its population of some 500,000 people is composed of Turks, Persians, Armenians and South Russians. The ancient, walled Persian section is adjacent to modern apartment houses of reinforced concrete. A tank wagon consisting of a cask mounted on two wheels and drawn by a donkey may be seen delivering oil over an asphalt paved street. Veiled Moslem

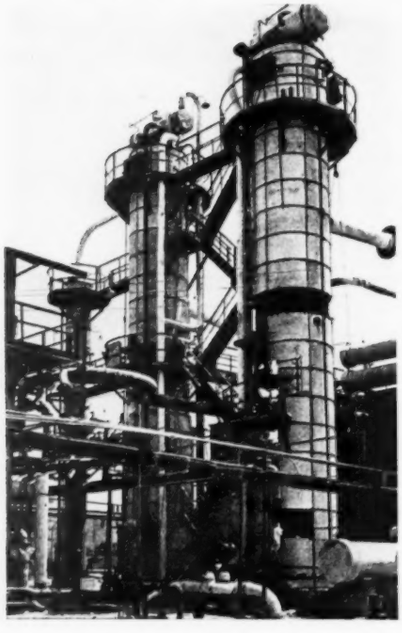
women and modern flappers stand in the same line in front of the co-operative stores. There is a lack of sanitation, and yet a modern system of bringing fresh water a distance of 60 miles, camel caravans, donkey trains, trolley cars and an excellent high speed electric line to the oil fields—a city of contrasts.

And around and in Baku everything is oil. The fields all lie within a distance of 15 to 20 miles. The old and still prolific Bibi-Eibat field is directly on the outskirts of the city. Surakhany and Balakany and others are further out to the north and east. In these fields and their different horizons are produced all grades of crude ranging from 12°-14° Beaumé gravity asphaltic base to 35°-36° Beaumé oils of practically pure paraffine base. Visualize the picture of tremendous reserves of all grades of crude oil within a 20 mile radius of the refining and distributing center. .

The daily production in the Baku district is about 190,000 barrels, with Surakhany and Bibi-Eibat the two leading fields, yielding approximately 70,000 and 40,000 barrels respectively. In olden days, practically all production was obtained by bailing. This method is practically superseded by pumping and by the air-gas lift. The last named has received intensive study. It is interesting to note that about 33 per cent of the production is obtained from 10 per cent of the wells by this method.

Most of the wells are drilled with rotary equipment. Perhaps 10 per cent of the completions are with cable rigs. An interesting new development is the turbine method. A water turbine with a cutting rotor is suspended in the hole. The water supply is by flexible hose and of high pressure. The water exhausting back from the turbine washes the hole.

Graver pipe stills have been in operation since July 1929



The principal producing sands are found at 2500 ft. to 3000 ft. Many lower horizons have been prospected and will be developed profitably later. Average production per well is 53 barrels daily.

The Baku refinery has a potential daily capacity of about 140,000 barrels. This capacity places it among the largest refineries of the world. This mammoth institution was evolved by the simple expedient of removing fences between some nine or ten privately owned plants.

In the Baku works, one can trace the development of the refining art from its beginning to the latest developments. Continuous distillation in batteries of shell stills reached its highest development in Russia. Numerous batteries of 12 to 16 stills are in use. The light oil stills are equipped with one or two internal flues and are internally fired. The products of combustion make three passes before leaving the setting. Residual and vapor heat exchangers are used. Fractionating condensers subdivide the streams from the individual stills to fairly close cuts. Neglecting the factor of increased depreciation charges and higher maintenance costs, the efficiency of such installations compares quite favorably with present day pipe stills.

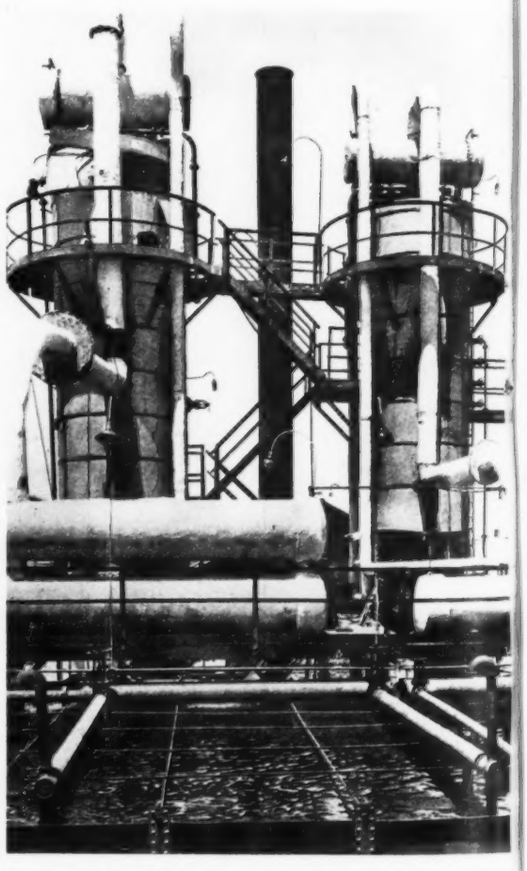
Illustrative of the ingenuity of the Soviet engineers in utilizing old equipment is a re-arranged topping unit, of which several have been built. This consists of three horizontal continuous stills. Residual and vapor heat exchangers raise the crude to 350° F. at which temperature it is "flashed" in an evaporator. The bottoms then go to the three continuous stills. Fractionation is accomplished by packed columns. Each unit of three small stills tops 40 per cent from 3500 barrels daily on a fuel consumption of 1.3 per cent. Considering that the units were constructed largely of salvaged material, this may be considered a notable achievement.

The average yield of gasoline and naphtha at Baku is about 7 per cent of the crude. The distillation range of these products is lower than usually encountered. The heaviest gasolines do not exceed 374° F. end point with 95 per cent at 338° F. Even the naphtha is of about 420° F. end point. With modifications of specifications and better fractionation this yield may be materially increased. The addition of further cracking units will also be a factor.

The latest improvements at the Baku works include pipe stills of American, German and Russian design. Considerable work is contemplated for the improvement of the lubricating and asphalt departments. There is very limited cracking capacity at the present time. Six 1000-barrel Vickers units are running, and there are no increases of cracking capacity now contemplated.

The central electric generating station, on the outskirts of Baku, furnishes power for the refinery as well as for the city railways and some of the fields. A second power plant is located at Bibi-Eibat. Originally a German enterprise, the Baku plant has been enlarged to a total capacity of 75,000 kw. The latest equipment includes Vickers turbo-generators operating on 1¼ pounds of steam per kw.-hour, and 1700 horsepower oil-fired Babcock and Wilcox boilers. These boilers operate at about 300 per cent of rating and produce 12 to 13 pounds of evaporation per pound of fuel. Great interest is shown in scientific control instruments, and the station has a complete system of indicating

Top of towers and coolers, Graver pipe still installation



and recording apparatus of all kinds.

From Baku, pipe lines for crude and refined oils extend to Batum on the Black Sea. The modern refinery at that point will when completed serve for export business. The present capacity is about 8000 barrels daily. Contemplated extensions will raise it to 30,000 barrels.

With the exception of one continuous still battery, all of the equipment for the Batum refinery will be of the latest design, largely of American manufacture. Pipe stills, both atmospheric and vacuum, Winkler-Koch and Jenkins cracking units, dewaxing and treating plants, are all being installed at present.

A feature of Batum's location delights every refinery operator. The plant has an unlimited supply of water from the ice caps of the adjacent mountains, the temperature of which does not exceed 35° F. even in the summer time.

The activities of the Grozneft parallel closely those of the Azneft, but they center in Grozny. Grozny is a small city, about 400 miles northwest of Baku and located on the northeast slope of the Caucasus Mountains. Like at Baku, the Grozny plant is a combination of old and modern equipment. Grozneft will have its export refinery and terminals at Touapse on the Black Sea. A pipe line is already laid from Grozny to that place.

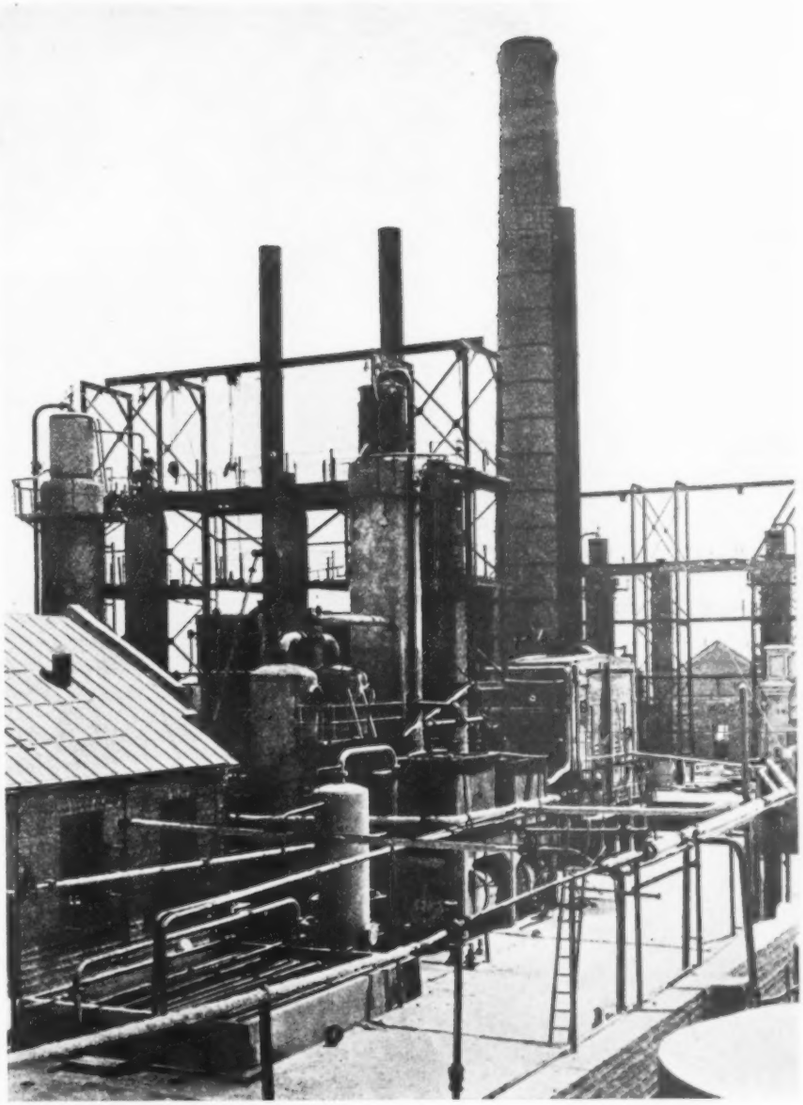
The Grozny production is largely from naturally flowing wells. The average flowing well of the district produces upwards of 1200 barrels daily. Rotary rigs are used almost exclusively.

The two large trusts, Azneft and Grozneft, refine about 81 per cent. of the production, and within a year it is anticipated that the figure will increase to 87 per cent. Further contemplated major oil programs embrace a pipe line from the Caspian fields to Moscow and a refinery in that city of 15,000 to 20,000 barrels daily capacity.

And all of this vast industry belongs to the people. Whether rightfully or wrongfully so is a controversial issue beyond our purpose in presenting these facts. How do these "worker owners" react? What are their condition? Are they productive? Are they progressing?

The average wage paid to oil field and refinery workers as distinguished from the managerial, clerical and technical classes is about 95 rubles per month, about $47.50 U. S. or nearly £10 at the Soviet rate of exchange. If it were not for indirect social benefits, this would be an oppressive wage scale.

The worker, however, is provided with living quarters, the rent of which is usually based upon a small percentage of his wages. The housing rapidly being built includes one- and two-family bungalows in rural districts and apartment buildings in the cities. They are modern, with conveniences, such as plumbing and electric lights.



First cracking plant built by Azneft. Capacity 1750 bbl. daily

Through his trade union the worker obtains his tickets to buy all kinds of supplies advantageously at the cooperative stores. Likewise, his amusements are provided at low cost. Free medical and dental services are available. Health and accident insurance protects him. Vacations are provided. Hence he can live on his earnings, but it is obvious that his real cost to the employing industry is considerably more than his mere wages. I have heard this indirect overhead variously estimated from 200 to 300 per cent of the actual wages.

The productivity of the individual worker compares very favorably with that of other countries in the producing, refining and distributing divisions of the oil industry. Drilling does not seem so efficiently done. This is unquestionably due to a lack of material and equipment, and the production per man will rise as these conditions are corrected.

The relatively good showing of the individual worker is maintained in large part by intensive propaganda. It is constantly impressed upon him that it is his field, his works and his pipe line. The benefits of a successful termination of the Five Year Plan are ever held before him. This message is on the billboards, in his papers, talked of in his clubs, and put up to him in the movies.

There has been decided progress in his living conditions. Now through his clubs

Bibi-Ebat Bay, showing the fill made for drilling

and unions he can learn to read and write. Education is open to his children as far as their abilities will take them. On the other hand, there are shortages of many supplies which the rest of the world would consider almost necessities. His movements are restricted under practically martial law. He cannot leave the country. But my reaction is that he is satisfied for the present and is willing to await the outcome of the Five Year Plan and to get behind it to the best of his ability. Education and the oil industry seem far apart, but in Baku they work closely together. The old Polytechnic Institute of Azerbaidjan has many courses devoted solely to the industry's needs. The geological department, all branches of the engineering and chemistry departments, are devoting much time to oil problems. I saw a thesis submitted, which covered the complete calculations, design and drawings for a pipe still with towers, exchangers and all adjuncts. The typed material filled quite a book, and there were many drawings. I wonder how many American graduates would be prepared to do as well. Everywhere there was great interest in the methods of technical education in other countries. Next to the co-operative food stores those selling books seem the busiest of all Russia. Books on everything. Economic theories and politics are probably the most popular, followed by technical books. The works of some foreign authors are to be found in translation, but outside literature is carefully censored for home consumption.

Installation of tanks in the kerosene treating plant

The engineers and chemists encountered were exceptionally well informed. Their responsibity is not great, due to the unusual managerial system in vogue, but as time goes on their ability will be recognized more and more. This class of men are the highest paid in Russia. If members of the Communist Party, they, of course, are pledged to a maximum salary of 250 rubles per month. The majority, however, are not affiliated and receive up to 400 or even 500 rubles. In addition, they are paid for their articles in the technical press and their books, or receive cash bonuses for patents. Others are paid for teaching in the technical schools.

Statistics seem dear to the Soviet

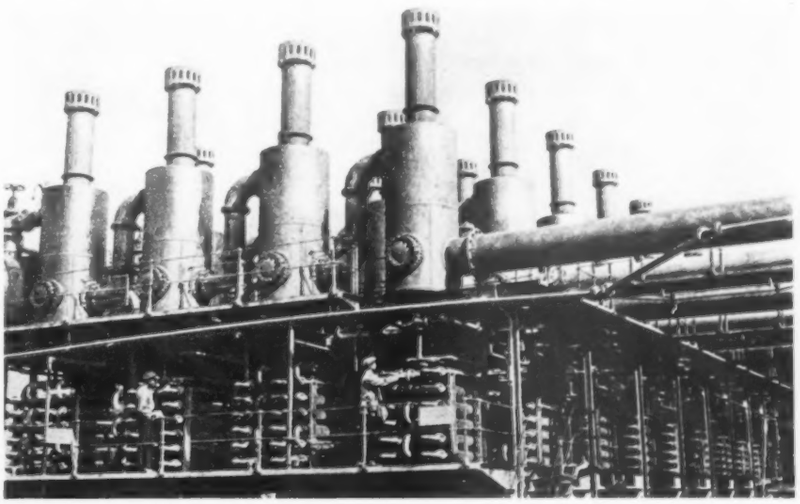
Apartment house construction in workers' city of Armanikand

Surachan oil field, scheduled for 30 million barrels this year

heart. They are available on almost any subject. In the oil industry they are most informative. Rarely are better cost and yield figures to be found. Likewise, the geological data are most carefully compiled. A far larger proportion of well cores are taken than is the case in other countries. The resulting sub-surface maps and sections seem most accurate. The actual drawings are works of art. Considerable progress has been made in the application of geophysical methods.

Management, as under all bureaucracy, tends to become top heavy. There is the constant surveillance of the workers' committees. Decisions are usually by committee action. It is difficult to place responsibility. Delays are baffling.

All Russia is committed to and gradually adopting the five-day week. In effect, a man works four days and is off the fifth day. Thus all factories, offices and stores run every day. In industrial plants the scheme has advantages. In offices, particularly of an executive type, the reverse seems true. When a chief executive has one in five of his department heads absent each day, delays are inevitable, and quorums of men each posted on the relation of his specialty to a given problem are impossible.



Towers and coolers—lub. oil distillation battery

But with all the advantages and all the difficulties, here is in effect one oil company with a present production of over 100,000,000 barrels per year, and a refining capacity exceeding 80,000,000 barrels. Within a year or two, a country in second place in petroleum production. No matter what our opinion on the political and social situation in Russia may be, we must admit that here is a force bound to become a notable factor in the world affairs of the oil industry.

Extensive housing development of Azneft at Armanikand

French Petroleum Politics and the C.F.P.

Refinery Construction Delayed by Government Efforts to Force Established Oil Companies to Sell Products of France's Quota of Iraq Oil

By E. J. André

ALTHOUGH the French Government duly passed in 1928 certain laws aimed at encouraging the refining industry in France, the country is still without refineries. What is the reason? The answer is there are several reasons.

The situation is complicated owing to the extremely divergent interests at stake—divergent . . . and international—for though in reality only France is concerned whether or not she has a refining industry, other nations, or more precisely certain sections of the oil industry of other nations, will be financially affected by the final decision in the matter.

Several questions have yet to be settled by the French Parliament before the apparently complicated machinery of the new refining industry can be set in motion, but the root of the delay seems to be the agreement signed on March 19, 1929, between the French Government and the Compagnie Française des Pétroles. One year later this agreement still has to be ratified.

The French Government and the Compagnie Française des Pétroles signed a first agreement in 1924 by which the French Government gave France's share of 23¾ per cent of the Iraq oil to the C.F.P. without however subscribing to the company's capital. In return herefor it was agreed that the State should participate on a sliding scale in the company's profits and excess profits.

By the agreement of March 19, 1929, the French State subscribes 25 per cent of the company's capital and has a prior right to subscribe to the same extent each time the capital is increased. The C.F.P. undertakes to form the Compagnie Française de Raffinage within three months of the ratification of this agreement, and in that new refining company the State will be entitled to subscribe up to one-tenth of the total number of shares issued. The most important clause of the agreement, and the one which is causing the most trouble, is clause 12, which stipulates that the State shall take steps to oblige all the companies holding licenses for the importation of crude oil products or residues to purchase quotas of finished products from the C.F.P. This clause is so framed that an importing company may be required to buy such finished products to the extent of 25 per cent of its licensed imports. This obligation is to be enforced as soon as the Compagnie Française de Raffinage is in a position to deliver refined products in sufficient quantities to satisfy demand.

The obvious objection to clause 12 is that it is likely to eliminate the rights confirmed on importers by the Act of March 16, 1928. As a consequence of the 1928 legislation a great number of new companies were floated, many of which applied for refining licenses. That result seemed to satisfy the object of the legislature. Why therefore do away with the advantages already conferred? This problem has been discussed at length. Not only have oil companies registered protests, but divergencies of opinion have been apparent even in Parliament itself, as is shown by the fact that no less than eight different amendments have been proposed to the 1929 agreement of the State and the C. F. P. Strange though it may seem, the foreign companies established in France have been the first to accept the above clause, but they have done so only with bitter protests. The fight has been severe, but the contestants have offered to solve the difficulties by accepting the contested clause if the Government for its part will agree to increase the future licenses, proportionately to the increased demand for oil and proportionately to the tonnage already sanctioned, when the present licenses for importing refined products expire in two years time. This would assure the companies of an ever increasing sale of oil in France.

Import Licenses for Petroleum Products and Proposed Quota from C. F. P.

	Licenses granted Tons	25 Per Cent from C. F. P. Tons	Balance for import Tons
Pétroles Jupiter (Royal Dutch)	450,400	112,600	337,800
L'Economique (Standard of N. J.)	416,850	104,212	312,637
Huiles de Pétrole (Anglo Persian)	265,300	66,325	198,975
Bedford Petroleum Co	68,700	17,175	51,525
La Mailleraye (Atlantic Refining)	45,400	11,350	34,050
Vacuum Oil Co	29,600	7,400	22,200
Huiles Sinco	21,000	5,250	15,750
Huilerie Centrale	9,700	2,425	7,275
Petroleum Products	8,400	2,100	6,300

The adjoining figures show actual tonnage of refined products imported by some of the foreign companies and the effect clause 12 will have if the agreement between the State and the C.F.P. is ratified without change.

French companies, such as the Raffinerie de Berre, the S. A. Pechelbronn, Raffinerie de Pétrole du Nord, Raffinerie de Bordeaux, etc., have so far refused to accept clause 12. Their refusal is based upon the claim that they as nationals should each be granted the advantages conferred upon the C.F.P. Hence the deadlock which has ensued, which Parliament certainly will have difficulty in ironing out to everyone's satisfaction.

It is quite possible that the whole oil industry in France will be revolutionized by the decisions taken by the Chambre when the matter comes before it. A few words about the proposed amendments and their scope will make this clear.

The amendments, although they appear to certain Deputies to be a necessity, seem to have a closer resemblance to new legislation than to mere amendments of an agreement. For example, Charles Baron (socialist) and Margaine (radical-socialist) virtually propose a monopoly of the refining industry. Mr. Baron, seconded by his party, has been endeavoring to organize this for some time. Mr. Margaine, failing a monopoly, would like to have all the French companies placed on an equal footing with the C.F.P., with the State having a participation in each company.

Mr. Guermier, more moderate in his views, proposes to distribute the Iraq oil equally between the companies which eventually construct refineries, without however favoring the C.F.P. in any particular way. He even has a tendency to abolish the effects of the Acts of March 16 and 30, 1928 concerning the importation of crude oil.

There is one mysterious point which has puzzled all those interested in the French oil industry. What is the real reason which has prevented the Government from granting licenses to import crude oil? This, in accordance with the Act of March 10, 1928, should have been done not later than four months after the Law promulgated. Opinions differ, but it has been said and this is a possible explanation, that the Government has withheld the permits because the banks to which the C.F.P. applied for capital refused to furnish it until the agreement of March 19, 1929, is ratified. Their motive was to force the Government's hand and to assure themselves that the C.F.P. would have all the advantages necessary to make it successful. Had the Government granted other companies their licenses to import crude oil before, or without protecting, the C.F.P., the latter might have been faced with undue competition, in which case the profits of the French Government and those of the shareholders would have dwindled accordingly.

As matters stand at the moment it is difficult to predict what will happen with regard to the amendments. The agreement will possibly be ratified by Parliament without great change. The present Minister for Commerce, Mr. Flandin, who held the same office in the first Ministère Tardieu, expressed a favorable opinion when the matter came up at that time, and he is likely to uphold that opinion now in the name of the second Tardieu cabinet.

Second International Drilling Congress

TAKING NOTE of the investigation which World Petroleum made into the reasons for the lack of American support to the Second International Drilling Congress, the headquarters of the organization in Paris issued an official statement last month, reading as follows:

"The National Drilling Committee of France has been glad to read the articles published in the technical press of the United States concerning the 2nd International Drilling Congress. It has ascertained with great pleasure that the abstention, almost complete, of that country, considered as much to be regretted, had caused some comment. It is, however, quite surprised to notice that said abstention is explained by the fact that the invitation, sent too late, has not been addressed to the qualified organizations.

"The invitation was sent to the United States at the same time as it was sent to the other countries which attended the Congress, that is seven months before the date set for the assembly. National Drilling Committees having been appointed in various countries, following the 1st Congress, it was with the said official organizations that the French Committee got in touch, leaving them the care to forward the invitation to all personalities and specialists likely to be interested and to attend the Congress. The Committee appointed by the United States was the National Research Council which, in its answer to the French invitation, declared itself ready to exercise its good offices to promote the success of the 2nd Congress, meeting in Paris, September 1929, in all practicable ways, including the encouragement of interest and participation in the Congress by engineers, geologists and manufacturers of drilling equipment in the United States.

"The American adhesion seemed therefore assured. However, the National Research Council, having inquired whether the United States Government would receive a formal invitation from the French Government, the French Committee deferred to this wish, although considering the invitation accepted by the National Research Council presented an official character as it had been sent out by an organization, the members of which had been appointed by the French Minister of Foreign Affairs.

"Moreover the French Committee, outside of getting in touch with the Committee officially appointed in the United States, had intrusted one of its members, Mr. C. Schlumberger, with the mission of calling on the American Petroleum Institute and establishing connections with all interested quarters. The A. P. I. merely answered without giving any further explanation, that it could not be represented at the Congress.

"Outside of what had been done directly with the National Committees, technical reviews of all countries of the world had been requested to give the Congress a large publicity. The whole of the European press accepted to advertise it, and did so, free of charge, by publishing, several months in advance, data concerning the Congress. The press of the United States, far from taking example from them, showed itself less generous, and, to our knowledge, hardly advertised it in spite of the fact that five of its most qualified periodicals had been earnestly requested to do so.

"The French Committee, conscious of having done its utmost to induce the United States to be represented at the Congress by a large number of delegates, was legitimately disappointed by the almost complete abstention of the country where the practice of drilling has undoubtedly reached its greatest development. It is, however, happy to notice that, in contradiction with the opinion uttered by a large number of delegates present at the Congress, such an absence is not the result of a policy of disinterestedness towards a European undertaking, and it hopes that the importance of the American attendance at the Congress to be held in Berlin, in 1931, will cause all misunderstanding about this to disappear."

Upon receipt of the official statement from Paris, World Petroleum submitted copies of it to the American Petroleum Institute and to the Division of Geology and Geography, National Research Council, the two American bodies named in the document.

The American Petroleum Institute has replied. The Division of Geology and Geography, National Research Council will consider the French statement at its next meeting early in May. Both replies will be published in the next number of World Petroleum. The A. P. I. states it is a trade association, and not, per se, a technical organization. It reiterates that it furnished a list of names of oil companies to the representative of the Drilling Congress.

Developments in Eastern Venezuela

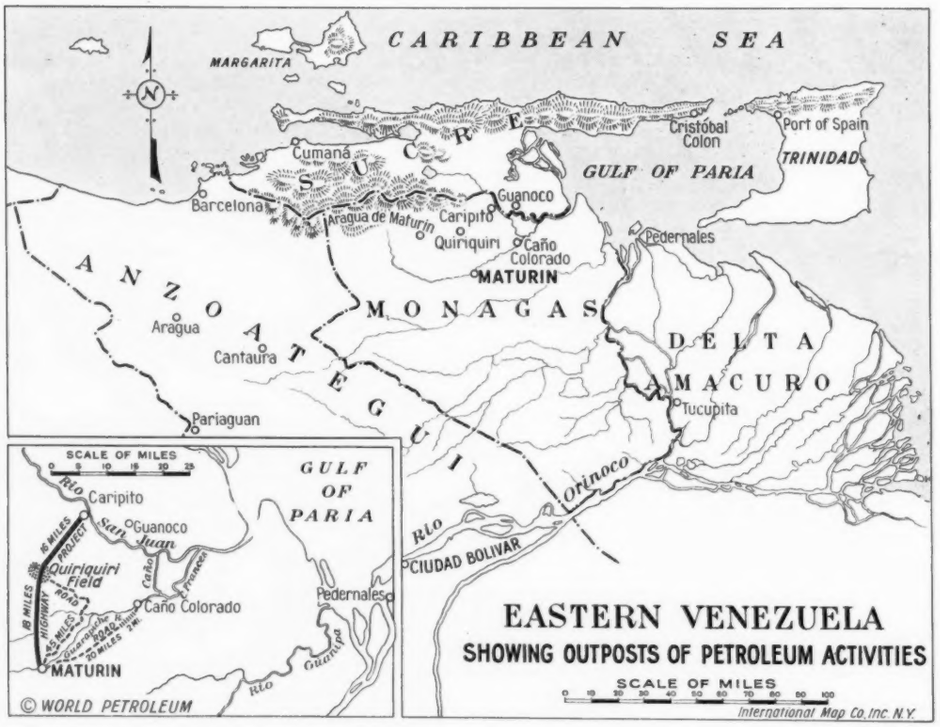
Creole Petroleum Corporation Making Preparations to Ship Crude from Quiri Quiri Field. Other Companies Pursuing Explorations

By D. M. Veysey

MARACAIBO DISTRICT will continue to be the main show in Venezuela's oil drama for years to come, but keep your eye on Eastern Venezuela, where the scene is being laid for big activities.

If there is any truth in prediction, seven companies will drill in Eastern Venezuela during the present year. This part of the country comprises the alluvial region lying between the north coast range and the Orinoco River, in other words, the states of Anzoátegui, Monagas, southeastern Sucre, and Territorio Delta Amacuro, the whole consisting of savannahs, with virgin forest indented by a maze of waterways along the eastern coastal belt. As the geological structure south of the Orinoco gives place to much older rocks, such as the auriferous quartz of the mining region in the State of Bolívar, it is generally held there is no oil south of the Orinoco.

Eastern Venezuela, however, has for some years been the scene of petroleum exploration, which has led to the establishment of concessions, principally in central and northern Monagas by the Creole Petroleum Corporation (Standard of New Jersey), in southern Monagas by the Caribbean Petroleum Coporation, and in Territorio Delta Amacuro by the British Controlled Oil Fields, Ltd.



Present Preliminaries

In Anzoátegui and Monagas mapping is being done by geologists of the Lago Petroleum Corporation and of the Richmond Petroleum Company (Standard of California). Torsion balance investigations are being carried on by the Caribbean, the Venezuela Gulf Oil Company and the Creole. The Gulf has also secured the services of a seismograph party from the McCollum Exploration Co. of Houston, Texas, and the Creole too has recently sent out a similar expedition composed of its own men to conduct seismographic research throughout Eastern Venezuela. Geological surveys of Eastern Venezuela have likewise been made by the Venezuelan Pantepec Company.

One Field Established

The Creole Petroleum Corporation is unique in having a proven field in Eastern Venezuela. After actively exploring this part of the country for nearly 8 years, the Creole now has in Quiri Quiri Field, north of Maturín, a very valuable property. Three "strings" for some time have been in operation, though production must await a future date when means of getting the oil to a deep water terminal have been provided. Quiri Quiri is only about 16 miles from the San Juan River, a tidal stream large enough to accommodate vessels, it is stated, of deep draft. However, because of the spongy nature of the ground for some distance inland, a large amount of engineering work has had to be planned before the Creole can use this handy outlet.

Construction Program Started

Work has been well advanced by the J. F. Martin Corporation, of New York, Mexico and Venezuela, under the supervision of Eric P. Jud and Ralph H. Busch. At Caripito, near the junction of the San Juan and Caribe Rivers, wooden piles have had to be driven for the construction of a pier and trestle which are to be over a mile long, to reach from deep water over the swampy bank to solid ground. Upon this, railroad tracks will be built to take incoming cargoes of material from the pier to the beginning of the 16 miles of highway which the Creole will have laid to the area of producing operations at Quiri Quiri.

Other projected constructions are a tank farm, a pipe line to get the oil out to tankers in the San Juan River, and a new colony at Quiri Quiri. Principal offices, warehouses, and shops will be shifted from Maturín to the Quiri Quiri colony, and field men, who have up to this time been obliged to leave their

families in Maturín, will have colony houses in the producing field.

Not only will this new project enable the Creole to market its product, but it will bring other benefits allowing this field to grow big and important within a short time. Easier, quicker, and cheaper means of getting supplies and employees in and out of headquarters are bound to result advantageously. This will be especially apparent when the new scheme is compared with the existing means of approach to the field, or to Maturín, present official headquarters.

Transportation System

The San Juan River has leading from it through the jungle a series of tidal waterways known as caños, ten miles up one of which is the famous asphalt lake of Guanoco, worked by the New York and Bermudez Company. While this San Juan system is even now used as the shortest means of communication between the Creole holdings and the outside world, it cannot be used to the best advantage without the deep water terminal that is being built.

Hitherto the difficulties and delays attendant upon getting materials to the field can hardly be overestimated. Supplies are first shipped to Trinidad, B. W. I., whence, through the allied West India Oil Company, they are transferred by schooner, a sail of two weeks, to Marietta Point, where Caño Francés joins the San Juan River. There transshipment is repeated, this time to flat-bottomed barges, formerly poled by native laborers, but now equipped by the Creole with two Johnson outboard motors each, thus saving one-half the time on all trips. Materials generally are deposited at the company warehouses at Caño Colorado, a town at the end of the tidal system, whence they are relayed, as occasion permits, in similarly equipped boats up the Guarapiche River to the Maturín supply station, a trip of 16 hours.

Transportation of persons is beset with the same handicaps, except that the trip from Port of Spain, Trinidad, to Caño Colorado is shortened by being made in company speed launches, of which there are two additional new ones. However, as the murky water of the caños conceals roots and logs, speed is not practical for the remaining states of the journey. So people continue by boat up the Guarapiche River or else drive to Maturín. In the dry season all or part of the road is passable, though most of the time the section near Caño Colorado has to be done afoot or in a native dugout on a small stream running alongside the road. In the wet season the overland journey must be made on mule-back, a distance of about 22 miles.

From Maturín it is possible to see the rig lights at Quiri Quiri any night, the direct distance being only about 12 miles. But the trucks that relay supplies from Maturín to the field have been going 37½ miles, taking from two to five hours, according to the weather, to reach another storage house situated just beyond the fording place of an unbridged river. From there, when the road is dry enough, tractors, drawing trailers on Athey-Truss wheels, haul equipment and supplies the remaining 7½ miles to Quiri Quiri.

This roundabout way has been used by the company as a temporary expedient taking advantage of an old road prepared by the Shell interests to communicate with a test well they once drilled near Los Mangos. Now that Quiri Quiri is a field of proven worth, the Creole has begun to cut its own road, to be only 18 miles long, following more nearly the direct line between Maturín and Quiri Quiri and bridging the intervening river.

Creole Concentrating

Although the Creole has done considerable exploring and drilling in its concessions in Maracaibo District and the State of Falcon, and has at Punta de Leiba, across the Lake from Maracaibo, a very fine colony of residences, offices, and workshops, the comparatively complete success of its Quiri Quiri Field will mean concentration of its activities in Eastern Venezuela as soon as the new improvements are constructed. H. C. Linam is now in charge of the Eastern Venezuela Division, with H. S. Young as assistant and W. E. Gray as tool pusher at Quiri Quiri.

Another part of Eastern Venezuela in which interest runs high, although not as yet containing any proven field, is the huge delta of the Orinoco, the Territorio Delta Amacuro, which experienced opinion has pronounced likely to become a "new Texas". Exploring in this district, which is criss-crossed with muddy caños, some as much as 100 ft. deep though often very narrow, and hedged with mangroves, is difficult. Much of the ground being swampy, there is a consequent scarcity of population, made up almost entirely of Carib Indians, about one person per square mile. The two main settlements, Pedernales and Tucupita, have about 200 inhabitants each. Mosquitos, while not obnoxious during the day or in February, when the dry season is at its height, are a terrible plague at night, though, the swamps being tidal, the malarial type does not breed there. Exploring is therefore mostly done by boat.

Companies in Delta

Foreign petroleum companies with concessions in the Territorio Delta Amacuro are the Richmond, the Creole and the British Controlled. Working out of Pedernales, the Richmond has an exploration party, while the Creole, whose interests are along the northern borders of the territory, has a seismograph party, already mentioned, which will include this region.

By far the largest interest in the Delta is that of the British Controlled Oil Fields, Ltd., which has a good field at El Mene, Maracaibo District, and has recently bought another in Ecuador. Its subsidiaries in this part of Venezuela are known as the Tucupita Oilfields Ltd., the Pedernales Oilfields, Ltd., the Antonio Diaz Oilfields, Ltd., the Araguao Exploration Company, Ltd., the Bolivar Exploration Company, Ltd., and the Loran Exploration Company, Ltd. In all, their holdings embrace more than 2,300,000 acres, the mapping of which is to be entirely finished by May 1st, when alternate strips of the concessions amounting to half the total number of acres, will pass into the hands of the Compañia Venezolana de Petroleo. This is an organization composed largely of government interests, and formed to acquire a national reserve. The most conspicuous test well driven by the British Controlled in the Delta was sunk to a depth of 1,600 ft., during which oil was struck four times.

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PROVIDED that concessions asked of the Federal Government are granted, the Mexican Sinclair Petroleum Corporation will develop its holdings in Mexico on a large scale and in the very near future, according to A. E. Watts, vice-president of the Sinclair Consolidated Corporation and president of the organizations Mexican company. This projected development program is in contrast to the curtailment policy followed by the larger oil companies in Mexico during the past two years.

Mr. Watts has been in Mexico on a tour of inspection of the company's holdings, and was accompanied by E. E. Swift and Major M. H. Anthoni, of the legal staff, and W. G. Tschudin, general manager in Tampico. He declared that Mexico sees the general oil situation throughout the world now demands careful study if that country is to regain its former position as the world's second petroleum producer.

Outcrop on Horse River, showing 30 ft. of high grade bituminous sand under 10 feet of gravel overburden

Alberta's Bituminous Sands May Be Mined

Development Will Follow if Low Costs of New Process for Centrifuging Oil from Sand Are Confirmed by Commercial Scale Tests

By W. P. Hinton

Former Vice-President
Grand Trunk Rly., Canada

FAVORABLE indications that the Alberta bituminous sands can be excavated and the bitumen extracted at a local cost comparable with that from oil well production has opened up possibilities of developing this field in the near future. A summary of the process is appended to this article.

For some miles above and 100 miles below Fort McMurray, Alberta, the present terminus of the railway 300 miles north of Edmonton, the Athabaska River and its tributaries show numerous exposures of bituminous sands.

This oil field, probably the largest in the world, is also among the oldest, the geological age of the reservoir being placed at between 85,000,000 and 100,000,000 years. In the glacial age, erosion uncovered the sands with the loss of the lighter volatiles, so that the bitumen is inert in the form of a viscous coating of the sand particles. This can be readily freed from the sand by mechanical process.

Well drilling is useless because there is nothing to activate the oil, nor owing to the nature of the sands can shaft sinking be done economically. The operation of excavating the sand and extracting the bitumen is purely a manufacturing problem where costs can be definitely ascertained. Obviously, the cost must be comparable with that from oil well production. Definite indications that this has been done successfully in recent runs at Edmonton opens up possibilities in developing this field in the near future. Rail distance to existing refineries in Western Canada is less than from existing sources of crude oil supply.

Bituminous Content

So far it has not been definitely determined by what means these sands were impregnated with the bitumen. The formation is overlain by the shales which constitute the basal member of the horizontally disposed cretaceous series in this region, resting directly on the Devonian limestone with very little unconformity to mark the great lapse of time intervening between the deposition of the two. The bitumen with which it is impregnated is believed by many to have had its origin in the Devonian formation.

The limestone immediately underlying the sands is at about 800 ft. above sea level. Beds of the bituminous sands vary in thickness from a few feet to 75 ft. of rich bitumen content. Combining lower grade sands, they reach in some instances 175 ft.

The content of bitumen varies with the locality and with the fineness of the sand, the finer sand being the richer. The bulk of the sand ranges from 40 to 80 mesh although much will pass 100 mesh. In fifteen representative tests made by Mr. Ells, the bitumen content varied from 10.6 per cent to 27 per cent. Even richer samples from borings have been taken. For these reasons, on areas naturally selected for operations for many years to come, it is quite safe to estimate a recoverable average of one barrel of bitumen per ton of sand.

S. C. Ells of the Mines Branch, Department of Mines, Ottawa, has carried on investigations of these bituminous sand areas of the Athabaska River section for many years. His report states:

"Although the area represented by actual outcrops has not been accurately determined, it is probably not less than 750

square miles. Extension of the deposits under heavy cover, particularly to the south, will greatly increase the estimated area". He points out that in the recession of the glaciers the Athabaska River undoubtedly flowed directly east to Hudson Bay instead of at present north to the Mackenzie, predicating on this theory that the bituminous sands probably occur in even richer deposits underlying a very large area to the east which owing to the overburden one is unable to estimate.

Aside altogether from the known visible outcrops that can be measured, the field is very vast. For instance, in drilling for oil in a structure on the Peace River, 300 miles west of the Athabaska exposures, we encountered the same sands at 850 ft. with all the characteristics of the exposed beds on the Athabaska. About ten or twelve holes were sunk along the Peace with the same results in each—the oil recovery being very small. There is little question that under heavy overburden the field is very vast. It cannot be valuable until some method is found of either mining the sands out or loosening the oil in place, and the resources therefore cannot be more than vaguely estimated.

Typical bituminous sand exposure, Athabaska River

Mr. Ells estimated a typical tonnage of commercial sands per acre per one foot depth of sand at 2,380 tons. Thus a bed 50 ft. thick will yield about 120,000 tons per acre. The estimated aggregate volume of these sands is 500 billion cubic yards. To saturate this sand required a volume equivalent to at least 50 billion cubic yards of crude petroleum. These figures are staggering.

Oil Estimates

Dr. T. O. Bosworth, then chief geologist for the Imperial Oil Company and later petroleum technician for the British Government, during an address at Edmonton a few years ago, stated that the bituminous sands of Northern Alberta formed the world's largest known oil field. He computed the area of these sands sufficient for 30 billion barrels of oil. Estimates of course vary.

Dr. Gustav Egloff and Jacques C. Morrell, two engineers whose standing is beyond question, in a paper delivered before the American Institute of Chemical Engineers a year ago, reported:

"The known bituminous sand deposits (Athabaska) are estimated to contain over 100 billion barrels of bitumen. When the economic demand is high enough for gasoline, the Alberta bitumen can be converted into over 35 per cent of high anti-knock motor fuel. The quantity of gasoline obtainable would be more than 35 billion barrels or enough gasoline to supply the present world demand for over a hundred years."

Analysis

Mr. Ells gives the following results of analysis of sand combined from samples taken from six representative outcrops:

	per cent
SiO_2	95.50
Al_2O_3	2.25
CaO	0.50
Fe_2O_3	0.35
MgO	0.23
Less loss on ignition	1.50

From destructive distillation tests, the following determinations were reached:

GASOLINE—50.8 degrees A. P. I. gravity, 36.3 per cent of bitumen cracked, 27.2 per cent unsaturated hydrocarbons, 34.2 per cent aromatic hydrocarbons, 12.3 per cent napthalene hydrocarbons and 35.8 per cent paraffin hydrocarbons.

LUBRICATING OIL—High viscosity, resists scorching or freezing.

ASPHALT—Suitable for fine arts materials, shellac and mastic paints, etc. In road paving has no superior.

The bitumen is rich in fatty acids. Owing to the complete molecular decomposition, recoveries under ultimate refining for chemicals look attractive.

Climate and Transportation

Spring, summer and autumn are similar to other sections of Alberta. Wheat matures regularly much farther north. Precipitation is light. Winter is similar to that in the mining district of northern Ontario, but the snowfall is much lighter. Rivers are clear of ice by April 15-25 and remain open until November.

The Northern Alberta Railways (owned jointly by the Canadian National and Canadian Pacific Railways) are in operation between the bituminous sands area and Edmonton, connecting there with the two transcontinental lines. A network of lines is being spread throughout the north country as well.

There are four companies operating river steamers from McMurray to the Arctic Ocean and up the Peace River to the Rocky Mountains, navigable routes aggregating 7,100 miles. With numerous power boats in river and lake traffic besides the railway needs, a considerable market is already developed.

Present Utilization

Up to the present time, the only commercial use to which the bitumen has been applied is for paving purposes. The results have been most successful, and the Prairie Provinces have extensive programmes for road building using this asphalt in preference to other materials.

Exposure of bituminous sand on east bank of Athabaska River

Attempts to crack the bitumen directly from the sands have been numerous over the past 20 years. Many processes have been patented, based on both high and low temperature carbonization, none of which have been entirely successful, largely owing to excessive costs or inevitable distillation troubles. Hot water and steam separation systems as well have not been able to clear the bitumen from sand, silt and other impurities objectionable for refinery practice.

The application of the three-way centrifuge separation of the emulsified bitumen has now overcome these difficulties, so that the bitumen, freed from all solids and impurities at low cost, can be turned into the refinery for distillation by standard practice.

Centrifuging Tests

With respect to the centrifuging process, a complete and thorough report cannot be made until an installation on a commercial scale has been made. The trial was made with a centrifuge of about 70 tons sand capacity per day. The centrifuge delivered the crude oil from the emulsion fed into it with merely a trace of mineral or other matter disclosed in laboratory tests. The sand was known to have a content of 32 Imperial gallons or over 38 United States gallons of bitumen per ton. In a series of tests through drilling and pit sinking by Mr. Ells over the last four or five years, he has ascertained that the content of the sands of the different areas varies considerably, as much as from 10 per cent to 30 per cent. He thinks it quite safe to estimate the average recovery of at least 1 barrel of crude oil from each ton of sand. Naturally, it will not be necessary or advisable to develop the leaner sands for many years to come. The sands we used were easily procurable alongside the railway, which was already opened up for paving materials, otherwise we could have secured richer sands with correspondingly better results. The sand was discharged white and clean of any bitumen, and the water was quite clean except for the silt and micaceous particles which naturally took that outlet instead of going out with the sand.

Future Utilization

In order to obtain a satisfactory yield of gasoline from the heavy crude, hydrogenation may be employed by cracking the natural gas procurable in the field or elsewhere at a suitable refinery point.

Lubricating oil stock of a superior quality can be produced and marketed over a wide territory.

Asphalt, suitable for shellac and varnish manufacture, mastic paints, roofing, etc. will find an extensive market both in Canada and abroad. Its special qualities for paving and waterproofing will command the market in Western Canada. Steamboats and railways may be expected to absorb any excess of fuel oil produced beyond plant requirements.

The crude at point of production is much nearer existing refineries than the fields from which the supply is now drawn and can be sold in that form, if desired, at a reasonable profit under present competitive conditions.

Thus the recent development of a simple mechanical process for the cheap conversion of this enormous volume of crude oil to commercial use enlarges the world's reserve for many years after the present known fields are exhausted, renders Canada independent of all outside sources of supply, and, instead of being the smallest producer, it may rank in time as one of the greatest.

THE Laughlin process referred to in connection with the recovery of bitumen from the Alberta oil sands is essentially a simple combined mining, disintegrating and cleaning process. By it the sands are caved-mined hydraulically through adits or shafts and drifts, without previous removal of the overburden and with disintegration of the sand mass during mining.

After the disintegrating, the mixture of water, sand and oil is pumped to tanks of the Laughlin-Asch type. There two products are made, first, a clean sand for discard and second, a water and oil with some sand which passes to a low speed Laughlin continuous centrifuge, where a three-way separation is made.

In lieu of the centrifuge at this point a vacuum bottom with automatic sand discharge may be installed on the Laughlin-Asch tank, and the water and oil separated by a high speed centrifuge such as Sharples, Acme or Delaval.

The low speed three-way centrifuge is not a development exclusively applied to oil sand operation, but a machine which has found extensive use in many industries. In the event that a pure oil product is desired it is essential that high speed centrifuging follow any preliminary operation.

In principle the above method of recovery follows closely that of standard mining and concentration of metal values in ores, using standard simple equipment throughout. It would be adapted to either underground or surface deposits of paraffin or asphalt base sands.

The estimated recovery costs on Alberta sands are 44 cents per barrel of oil, based on a daily minimum plant capacity of 1,000 tons of 15% oil content.

Costs in any event would depend on the thickness of the available deposit and on the physical condition with reference to mining, because the separation and recovery of the oil product from the sand offer no difficulty.

The immediate commercialization of any one of these deposits is necessarily a question of the market for those products at a price which would warrant the operation. W. P.

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CLAIMS cannot be staked in the bituminous sands deposits. This privilege of filing was withdrawn by Order-in-Council in 1912. Many claims then in existence have since lapsed. Only three or four remain, totalling altogether not more than 20,000 acres and not all of this commercially accessible. The immense riches were reserved by the Government. The right to exploit them must be secured through leases. W. P.

Mexico Encourages Oil Development

Luis L. Leon, New Minister of Industry, Commerce and Labor, Reports Greater Exploration Activity, Increased Production, Larger Exports and Bigger Domestic Consumption

MARKED resumption of activity by Mexico's petroleum industry is seen in a report on the present condition in the Republic's oil fields, just made public by the Ministry of Industry, Commerce and Labor.

"While, at the present time, activities in our oil fields as a whole are little better than mere routine, gratifying work is being done in certain parts of the Republic, namely the Isthmus of Tehuantepec and along the northern frontier," the report observes.

"In the Isthmus of Tehuantepec the activities embrace all phases—geological explorations, production from wells, use of natural gas in the manufacture of gasoline, repressuring of wells, construction of pipe lines for the transportation of crude, gasoline and gas, and the general improvement of equipment and refining facilities."

"Two pipe lines, of 60 kilometers (37½ miles) in length each, have practically been laid in this region, to carry oil and gas respectively from the petroleum fields of the Tonala zone to the refinery at Minatitlan. For the transportation of gasoline from the fields to the shipping port of Rio Coatzacoalcos, a third line, approximately 38 kilometers (24 miles) long, is being laid.

"Along the northern border drilling has been done in several places. The Ohio Mexican Oil Co. in the municipality of Jimenez, state of Coahuila, drilled to a depth of 1024 meters (3380 ft.); the Mexican Zinc Company, in the coal region of Muzquiz in the same state and about 143 kilometers (90 miles) from the border, brought in a well at 461 meters (1520 ft.); the National Administrative Control of Petroleum in Lampazos, state of Nuevo Leon, about 57 kilometers (36 miles) from the border, found oil at 533 meters (1760 ft.), and in the region of Los Aldamas, state of Nuevo Leon, 70 kilometers (44 miles) from the border, at 460 meters (1520 ft.). La Imperio (Interstate Cities Service) struck oil at 780 meters (2575 ft.) in the region of Guerro, northern district of the state of Tamaulipas, about 20 kilometers (12½ miles) from the border. (All these wells were brought in during March.)

"Between February 11 and the middle of March of the present year, 45 wells were drilled in Mexico. Besides those already mentioned, wells were sunk in: San José de las Rusias in the center of the state of Tamaulipas; Altamira, in southern Tamaulipas; along Rio Panuco; Tangiijo, to the south of the Laguna de Tamiahua; between Rio Tuxpan and Rio Cazones; Chicontepec; Norte de Papantla and the Isthmus of Tehuantepec. (Practically all work in this latter region is being done by the Mexican Eagle Oil Co., a subsidiary of Royal Dutch-Shell).

"Several of the holes were carried to a great depth. For example, the Poza Rica No. 2 of the Mexican Eagle Oil Co. in Norte de Papantla is 1935 meters (6385 ft.) deep. For the first time in Mexico a start has been made in the drilling of wells to great depths. Wells along Rio Panuco have been sunk to between 1200 and 1500 meters (4000 ft.-5000 ft.)", states the report, continuing:

"Nine wells with a total average daily production of 1249 cubic meters (about 7850 barrels) were brought in between February 11 and March 10 of the present year. These wells are in Ebano and Cacalilao along Rio Panuco, in Chapapote de Nuñez, near Rio Tuxpan and in Tonala to the northeast of the Isthmus of Tehuantepec. Of the wells which were brought in along Rio Panuco, two are in the old Ebano and Dicha fields, in lands where there has been no activity for some time. From January 1 until March 10 a total of 21 productive wells have been brought in in the various Mexican oil fields.

"From January 1 to March 10, 42 permits were granted for the drilling of wells—17 were issued in January; 19 in February and six during the first part of March. These permits are for drilling in the north of the state of Coahuila, the north of the state of Nuevo Leon, north and south of the state of Tamaulipas, along Rio Panuco, south of the Tuxpan region, in Norte de Papantla, in various fields of the Isthmus of Tehuantepec and in the west of the state of Tabasco.

"Mexican petroleum production in February was 3,270,661 barrels, of which 1,293,104 barrels were heavy crude and 1,977,557 light crude. During the first two months of 1929 Mexican oil production was 6,645,178 barrels, but the output for the corresponding period of the present year has been 344,137 barrels greater. Petroleum exports during the first two months of 1930 have been 3,631,399 barrels, or 440,313 barrels greater than during January and February, 1929, when the total exports were 3,191,086 barrels.

"Consumption of gasoline in Mexico is decidedly on the increase. During January of this year the consumption was 21,178,857 liters (4,591,218 U. S. gal.), and in February it increased to 30,491,064 liters (8,049,640 U. S. gal.), or a total of 51,669,921 liters (13,640,859 U. S. gal.) for the first two months of this year, which is 1,556,710 liters (310,971 U. S. gal.) better than during the corresponding period of 1929, when the consumption was only 50,113,211 liters (13,229,888 U. S. gal.).

DOUGLAS GRAHAME

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UNDER a decree issued by President Pascual Ortiz Rubio approval is given to a proposition submitted by Luis L. Leon, Minister of Industry, Commerce and Labor for the appointment of a committee of experts to make a study of the condition of the petroleum industry in Mexico. It is said that the petroleum companies have repeatedly complained to the Ministry of difficulties which beset them in functioning.

The investigation committee will be comprised of the director of the Administrative Control of Petroleum as chairman, the chiefs of departments of petroleum and jurisdiction of the Ministry and the sub-chief of the department of petroleum. The group will study all questions concerning the oil industry and suggestions made by the various petroleum companies. A complete report on its findings will be submitted to President Rubio at an early date.

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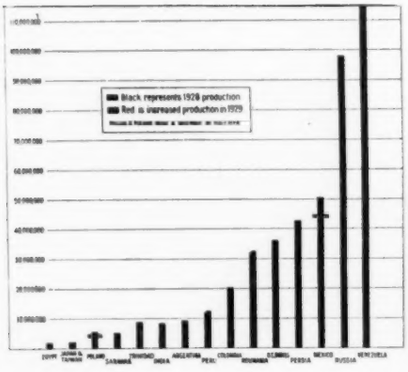

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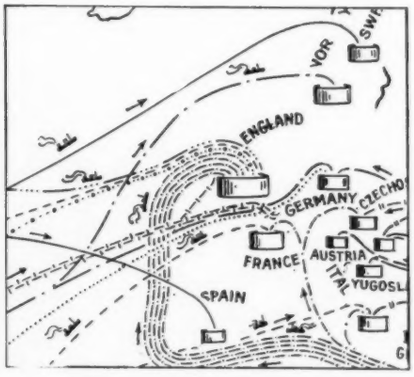

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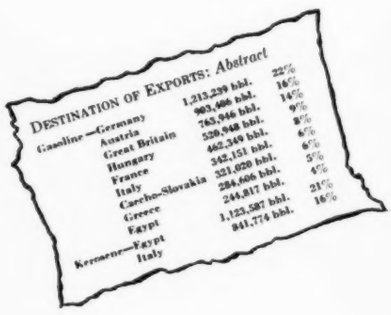
DESTINATION OF EXPORTS: Abstract
Gasoline—Germany 1,213,239 bbl. 22%
Austria 983,466 bbl. 14%
Great Britain 783,946 bbl. 14%
Hungary 520,948 bbl. 9%
France 462,249 bbl. 8%
Italy 342,151 bbl. 6%
Czecho-Slovakia 321,020 bbl. 5%
Greece 284,606 bbl. 4%
Egypt 244,817 bbl. 21%
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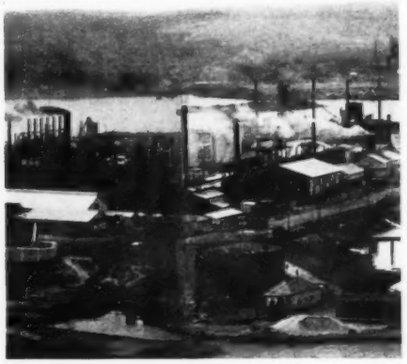

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Tempora Mutantur et Socony-Vacuum Illi

Standard Oil Company of New York Recites Changed Conditions in Oil Industry All Over the World in Answer to U. S. Government Condition to Restrain Merger with Vacuum

FOLLOWING the announcement of the merger agreed upon between the Standard Oil Company of New York and the Vacuum Oil Company, the United States Government petitioned a Federal District Court to restrain the merger as a violation of the decree of the Supreme Court dissolving in 1911 the illegal combination between the Standard Oil Company of New Jersey and 70 subsidiary companies. Socony (the Standard Oil Co. of New York) and Vacuum had been designated sixty-fifth and sixty-seventh among the defendants in the 1911 suit.

The petition just made by the United States to the District Court is named a supplemental petition. In answering it, Socony and Vacuum set forth what type of combination was adjudged illegal in the 1911 decree. The defendants argue:

"10. (a) The combination adjudged illegal by the decree was described by the Supreme Court as a monopolistic combination resulting in the unification of power and control over petroleum and its products effectuated through combining in the Standard of New Jersey the stock control of the various defendant subsidiary corporations described in the decree with the intent and purpose of maintaining dominancy over the oil industry, of driving others from the field and excluding them from their right to trade and of thus centralizing in the combination a perpetual control of the movement of petroleum and its products in interstate commerce and accomplishing the mastery which was the end in view. The Court described the exercise of the resulting power as marked by the acquisition of every efficient means by which competition could have been asserted, resistless methods whereby means of transportation were absorbed and brought under control, and the adoption of a system of marketing whereby the country was divided into districts and the trade in each district in oil was turned over to a designated corporation within the combination and all others excluded. The Court declared that the monopolization and absolute control which existed over the refined product carried with it the power to control the crude product."

In so far as the Socony-Vacuum merger is concerned, the present defendants call attention to the fact that the dissolution decree of 1911 did not, and could not, enjoin the former subsidiaries of the Standard Oil of New Jersey from entering into such commercial agreements as might lawfully be made by other corporations and they state:

"(c) No issue was raised by the pleadings in the suit as to the lawfulness under the Anti-Trust Act of the union of any two of the numerous former subsidiaries of the Standard of New Jersey after they had been freed from its domination and control by the operation of the decree and there is no provision in the decree which deprives these former subsidiary corporations, freed from such domination and control, of the right to deal with their properties and business in any way which would be lawful for any other corporation or citizen of the United States, nor could such provision lawfully have been made."

Specific direction on this issue seems to have been sought from the Supreme Court, because the Socony-Vacuum response states further:

"(e) Upon appeal to the Supreme Court objection was raised by certain defendants that the phraseology of Section 6 might be construed to have the effect of precluding for the future agreements or combinations between two or more of the former subsidiaries, although such agreements or combinations would, after termination of the control exercised by the Standard of New Jersey, be lawful and desirable in the public interest and that such section so construed would be improper. The Court held that these objections were irrelevant because Section 6 of the decree was construed by the Court not as depriving the stockholders of the corporations involved, after dissolution of the combination, of the power to make normal and lawful contracts or agreements but as restraining them from by any device whatever recreating directly or indirectly the illegal combination which the decree dissolved. The Court further stated that it construed Section 6 of the decree not as depriving the stockholders or corporations of the right to live under the law of the land, but as compelling obedience to that law."

Predicated thereon is the contention of Socony and Vacuum that their merger is not in violation of the decree entered in 1911 by the Supreme Court against the Standard Oil of New Jersey and its co-defendants (amongst whom were numbered the present defendants, Socony and Vacuum).

"(f) The union of Socony and Vacuum —two of the numerous subsidiaries of the Standard of N. J., long since freed from its control—is not in violation of Section 6 of said decree as thus construed by the Supreme Court of the United States. Such union is not for the purpose and will not have the effect either (1) of 'continuing or carrying into further effect the combination adjudged illegal' by said decree and long since terminated by the operation thereof, or (2) of 'entering into or performing any like combination or conspiracy the effect of which is or will be to restrain commerce in petroleum or its products among the states or in the territories or with foreign nations or to prolong the unlawful monopoly of such commerce condemned by said decree."

In conclusion the defendants put forward their reason for the merger and characterise their consolidation as a business need of the two companies in meeting the changed conditions of the petroleum industry, comparing the year 1911 with the year 1930.

"12. The contract for the union of the resources of the two companies has had its genesis in the effect upon these corporations . . . . of normal developments in the oil industry which have been going on in the United States and abroad with accelerated effect in recent years. It is neither the purpose nor can it be the effect of this contract to restore the domination of the Standard of New Jersey over these companies or the industry; which was terminated by the decree finally entered in this suit in 1911. This contract is not intended to nor will it have the effect of creating a like unlawful combination. On the contrary, the contract complained of is a

normal and lawful contract growing out of the particular business needs of the respective companies for the attainment at home and abroad of objectives natural and lawful for concerns engaged in the trade and industry of the United States."

Changed Conditions in the Oil Business

Woven into the complete answer of the defendants to the U. S. Government petition appear sketches of the relative volumes and natures of the two companies' businesses, of the manner in which competition has gradually reduced their proportion of trade in the last two decades, how powerful new organizations have grown up in the world—possessing better and vaster distribution—and how the union of the two companies or an equivalent merger must be consummated if they are to hold their own.

Emphasis is laid upon the contrast afforded between the sales of oil products in 1911 and those of the present day. Whereas then, the so-called naphtha was an undesired by-product of the greatly demanded kerosene, now that same product is the gasoline of an automobile age and the controlling factor in the oil trade. Lubricants have become a staple of popular trade.

"Nearly all gasoline and other automotive products are sold under brands and trademarks, and to secure the patronage of automobilists, advertising has been resorted to upon a very extensive scale by the various companies to push their particular brands.

"With these developments there is an increasing integration of the industry into concerns each engaged in the production of crude oil, the refining of that oil into the desired petroleum products and the distribution of these products to consumers. This tendency has operated in two ways. Concerns based on large crude supplies have developed their own refining and distributing facilities for the marketing of refined products. On the other hand, concerns formerly engaged merely in distribution have, for the protection of their marketing business, acquired their own crude production and refining facilities for the manufacture of the products which they market.

"The pressure for outlets for crude supplies and refined products and the desire to avail to the full of the good will created in particular brands by quality and advertising have had the effect of impelling each of such numerous integrated concerns toward expanding its activities widely throughout the country instead of confining itself to one region.

"The result has been that there is a steady tendency away from any one company having a preponderant proportion of the business even in one region and there have been developed a large number of strong, integrated companies doing business very widely throughout the country, each with a moderate proportion of the business. The Texas Company and Royal Dutch Shell have already extended to nation wide operation and numerous other companies are following in that direction. There are in addition in each locality numerous relatively small units each doing an active local business.

"The proportion of crude production and of refining facilities of the United States possessed by Socony and Vacuum, and the proportion of petroleum products consumed in the United States handled by these two companies in 1929, were approximately as follows:

	Socony	Vacuum	Others
Crude production (net)	4.4%	0.1%	95.5%
Refining capacity	6.2%	0.8%	93.0%
Gasoline	8.1%	0.8%	91.1%
Kerosene	8.2%	0.04%	91.8%
Fuel, diesel, gas and furnace oils	7.1%	0.3%	92.6%
Lubricating oils and greases	6.2%	6.6%	87.2%
Miscellaneous products	6.7%	0.05%	93.2%

The business of affiliated companies is included unless otherwise specifically indicated.

"Of the gross volume of all products marketed by the two companies respectively in the lines of business actively pursued by them in the United States in 1929, less than 7% were products of the same general type sold in the same general areas, and this amount constituted less than one-half of one per cent of the total consumption of such products in the United States. Even as to this amount there was marked diversity in the localities, customers served, grades and price range."

Socony in the United States

"Prior to the decree in this suit, Socony in the United States was substantially merely a marketing agency in New York and New England for the Standard of New Jersey, handling over 85% of the business in gasoline, kerosene and other petroleum products in these states. The tendencies in the industry mentioned above have greatly widened in these seven states the activities of other companies already operating in them and have steadily brought into them still other companies from other parts of the country.

"By 1926 it was estimated that the proportion of business done by Socony in these states in its principal product, gasoline, had dropped from 85% to 46% In 1929 the proportion done by Socony had dropped to about 34% as to gasoline and kerosene and to considerably lower percentages as to other products.

"During this period numerous new local concerns have started up business in this territory. Major competitors, with extensive crude supplies, refining and distribution facilities, have from time to time, directly or through subsidiaries, extended their business from other territory into these states.

"The steady decrease which has occurred and which will inevitably continue in the proportionate share of the business done by Socony in New York and New England, where it was originally established, and the same reasons which have caused most of the other important integrated companies to spread into this territory from the parts of the country where they were originally established, have led Socony to extend its business into other states and are now impelling the further widening of its sphere of competition. This result will be accentuated by union with Vacuum.

"Prior to the decree Socony, being under the control of the Standard of New Jersey, had not been developed in a normal way as a properly integrated company in New York and New England for the products of Standard of New Jersey, and when freed from its control was in a precarious economic situation. It had in New York and New England a great and growing investment in the intensive marketing facilities which were becoming increasingly essential in the distribution of petroleum products. On the other hand, it had no crude supply whatever, and its refining facilities were of such minor character that it had no base for its marketing structure. It was further faced with the extension into New York and New England, as outlined above, of powerful integrated companies having their own large supplies of crude and their own refining facilities.

"To meet this situation, Socony has obtained and developed crude supplies in the Mid-Continent, Texas and California fields and refining facilities in those fields. Theretofore it had had only minor refining facilities, and these were located in Rhode Island and New York.

"Socony has also extended its marketing facilities for gasoline and a general line of petroleum products from its original field of New York and New England in varying extent into twenty-two western and southwestern states.

"This extension of its marketing business has brought Socony widely into competition in states west of the Mississippi with the numerous companies, large and small, doing business in these regions, including several former subsidiaries of Standard of New Jersey and has also brought Socony into competition with the Standard of New Jersey itself through its present subsidiaries, Standard Oil Company of Louisiana and Humble Oil and Refining Company. Further, the building up of Socony as an integrated competitive unit and the consequent reduction of its purchases from its former owner, on which it was formerly almost entirely dependent for the products it marketed, was followed by the entrance in 1929 of the Standard of New Jersey, through its acquisition of the Beacon Oil Company, into active competition with Socony in New York and New England.

"Though making the most of its established good will, resources and operating experience in the above described expansion of its distributing facilities from seven to twenty-nine states, the proportion of the total volume of petroleum products consumed in the United States handled by Socony has decreased from probably over 19% in 1911 to something over 7% in 1929, and the total of its business together with that of Vacuum in 1929 was slightly over 8%. To diminish the effect of the continuing loss in Socony's proportion of the business in the states where it was originally such a large factor, it must still further widen its business in the other states it has entered and extend its facilities into still other states.

Vacuum in the United States

The history and development of Vacuum have been governed by its specialty business in high grade lubricating oils. Its refining operations are primarily directed to the manufacture of its lubricating oils, and such gasoline, kerosene and fuel oils as it produces amount, in its case, almost to by-products.

Prior to the dissolution of the old Standard of New Jersey the Vacuum distributed through the marketing machinery of the former. It had practically no marketing system of its own.

By widespread advertising and servicing Vacuum has built up a consumer demand all over the United States, and the power of this advertising forced gasoline distributors to handle the Vacuum lubricants.

Other companies, however, have in latter years been creating a consumer demand for their own lubricating products by similar extensive advertising, and have thus been able partially to close their outlets to Vacuum brands.

It would be impracticable for Vacuum to provide filling stations for the sale of its motor oil alone, and it has neither the crude supply nor the refining facilities for furnishing gasoline extensively. It has established some direct marketing outlets, but the only practicable way to meet its needs for nationwide distribution of its automobile oils is to associate itself with an integrated organization of crude, refining and widespread distributing facilities.

Effect of Merger in the United States

"The union of Vacuum with Socony will be a normal development from the situation in which Vacuum finds itself as a result of the influence on it of the changed conditions in and present tendencies of the petroleum industry. By such union the full value of its specialized lubricating brands will be preserved and they will be made more accessible through the use of Socony's present extensive filling station facilities to those consumers who prefer them. On the other hand the union will tend to extend the competition of Socony in the industry by introducing its products in localities in which it is not now doing business.

"The nationwide reputation of the Vacuum specialties will be of marked value in introducing Socony's gasoline in connection with these specialties in such localities, and the necessity for the protection of the Vacuum brands by affording them filling station facilities along with gasoline will furnish the united company an added inducement for it to extend its competition to gasoline in these localities.

"While this situation in the United States makes the union a natural one for both companies, highly important reasons for the union are to be found in circumstances which exist with relation to their business carried on within foreign countries as hereinafter set forth."

Vacuum and Socony in Foreign Countries

"Abroad Vacuum and Socony have been pioneer American enterprises in building up an extensive business carried on within foreign countries. The high grade Vacuum lubricating specialties for automotive, industrial and marine uses are marketed in practically every foreign country in the world except Russia. In addition, Vacuum through numerous branches and locally incorporated Vacuum Oil Companies, does an important business in the marketing of gasoline and kerosene in large foreign markets, including Australasia, Egypt, South, East and West Africa, and in Central Europe and Portugal, where Socony is not marketing these products.

"The activities of Socony abroad have been almost entirely in building up extensive storage and distributing facilities and the marketing of kerosene, gasoline, lubricating oil, fuel oil and other products in the wide markets of the Orient, India, the Near East and countries of the Aegean.

"The total amount of products handled by the two companies in their business within foreign countries, it is estimated, constitutes about 5% of the petroleum products consumed in those countries.

"Neither company has at the present time any crude production in foreign countries, but Socony will have a share of the crude production which is now being developed by international agreement in Irak. In Jugoslavia Socony has refining facilities and refines for Vacuum. Socony has no other refining facilities outside of the United States. Vacuum has some refining facilities in Poland, Hungary, Germany and Czechoslovakia.

"To supply the business which each of these companies carries on within foreign countries, each obtains supplies in part from foreign countries and to some extent manufactures such supplies locally in foreign countries, but in addition each transports very largely from the United States the supplies it uses abroad. The two companies together ship about 10.3% of the total volume of petroleum products shipped from the United States to foreign countries. A more detailed statement of the foreign countries to which shipments are made respectively by the two companies is given hereunder.

"In every foreign country in which either of the two companies is doing business conditions have arisen which present a serious problem. The foreign companies which they meet in competition have the advantage of crude supplies and refining facilities far more advantageously located with respect to such markets.

"Their principal foreign competitor, which does business in every market in which either of them does business, has extensive crude supplies and refining facilities in the Asiatic islands, directly available for the markets of Australia and the Far East, and its allied (*sic*) companies have important supplies in

Burma and Persia. These supplies are also available for South and East Africa. For South America it has extensive supplies in Venezuela, and extensive refining facilities in the Dutch West Indies. In Europe it has crude supplies and refining facilities and its South American supplies are also available.

"Its crude production, the largest of any company in the world, drawn from the United States as well as from these foreign sources, for 1929 was 176,000,000 barrels as against 57,000,000 for Socony and Vacuum together. Its world refining capacity is 704,000 barrels daily as against 264,000 for Socony and Vacuum together. Other foreign companies, though doing less widespread business than this principal foreign competitor, have similar local advantages.

"In this situation both Socony and Vacuum feel the need of the union of their resources, complementary businesses and facilities and established good-will, and of the economies that would be made possible by such union, to protect effectively the large investments made in the business they conduct in foreign countries and to develop that business further.

"The same changes in the petroleum industry through the integration of companies with crude supply, refining facilities and distribution of a general line of petroleum products which have been discussed in connection with the situation in the United States, are beginning to operate in many foreign countries and emphasize the importance of having crude supplies and refining facilities which are essential for protecting and broadening out the business of the companies.

"In addition to the general elements of needed strength which the union will give the business of these companies, the union of their resources will operate to their protection and in the development of their business in the following ways:

"In Great Britain and the various countries of Northern and Western Europe and of South America and Mexico, Vacuum has a long established business in lubricating specialties. Socony is not engaged in any business whatever in these countries. In such areas the union of the two companies will afford Socony an opportunity to introduce its gasoline, kerosene and other products, with the advantage of the footing, organization, trained personnel and equipment which Vacuum already has. With the necessary backing of existing and prospective crude supplies and the refining facilities of Socony for gasoline, the Vacuum business can be made more secure.

"Vacuum has an extensive marketing business in gasoline and kerosene in Australasia, South, East and West Africa and Egypt, Portugal and several Central European countries. Socony does not market these products in these regions. Here again the increasing development of powerful and highly integrated foreign interests, with ample crude supplies, refining facilities and distribution systems, makes it highly important for Vacuum in these areas to secure additional protection for its gasoline and kerosene interests, by having back of it sources of crude supply and gasoline refining facilities. This the union with Socony will go far toward providing.

"In the Orient, India and the Near East, Socony has a widespread storage and distributing system, developed primarily for kerosene but which, with the spread of the use of automobiles, is being extended to gasoline. Vacuum does not have extensive distributing facilities in this area, but its lubricating specialties have a wide reputation and market. The union of the companies will make available for Vacuum brands wider distributing facilities, and the reputation of Vacuum's products will be advantageous to Socony in developing its gasoline business in the face of competition of foreign companies which have the advantages hereinabove outlined.

"In all of the principal ports of the world the specialty marine oils sold by Vacuum have a high place. Such points of distribution will constitute a market for the distribution of fuel oils, one of Socony's important products."

Shipments from the United States

"Shipments of petroleum products are made by Vacuum and Socony respectively to the following countries:

GASOLINE.

"Vacuum takes gasoline to Egypt, East, West and South Africa, Morocco, Portugal, Australasia for distribution in the business carried on in those countries.

"Socony, on the other hand, takes gasoline to none of these countries, but ships it to Japan, Korea, China, Indo-China, Formosa, Siam, Philippines, Straits Settlements, Aden and Red Sea ports, India and Canada for distribution in the business which it carries on in those countries.

KEROSENE.

"Vacuum takes kerosene to Portugal, Egypt, East, West and South Africa, Morocco and Australasia, where it is distributed through the facilities which it has in those countries.

"Socony takes kerosene to none of these countries, but ships it to Japan, Korea, China, Indo-China, Formosa, Siam, Philippines, Dutch East Indies, Burma, Ceylon, India, Aden and Red Sea ports, where it is marketed through the extensive distributing facilities which it has developed in those countries.

FUEL, DIESEL, AND GAS OILS.

"Socony takes fuel and Diesel oil to Japan, China, Canal Zone and Alaska chiefly for bunker sales at various ports.

"Vacuum takes these products to none of these countries, but ships fuel oil to Australia and gas oil to Australasia and Portugal, and makes purchases of the fuel oil carried by Socony to Egypt.

LUBRICATING PRODUCTS.

"Vacuum sends its special lubricating products to Canada, Mexico, every country of South and Central America, Africa and Australasia and every country of Asia and Europe except Russia. Its business is very preponderantly in the high grade specialty brands.

"Socony takes lubricating products to the various countries of the Orient, India, and the Near East, and to Greece, Jugoslavia, South Africa and Australia.

"The business of Socony in lubricating oils in these countries is preponderantly in grades which sell at a different price range from Vacuum products and in so-called batching oils and other products not marketed at all by Vacuum.

MISCELLANEOUS PRODUCTS.

"Socony takes to the various countries of the Orient, India and the Near East and to Greece, Jugoslavia, South Africa and Australia, various miscellaneous petroleum products.

"Vacuum's shipments of such miscellaneous products are inconsequential."